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A POSSIBLE PRE-ALGONKIAN CULTURE IN SOUTHEASTERN MASSACHUSETTS

BY EDMUND BURKE DELABARRE

THE Algonkian tribes who occupied New England at the time when its known history began were probably not its earliest inhabitants. Remains of what may have been a pre-Algonkian culture have been discovered, notably that of the so-called Red Paint People of Maine. No indication, however, is given as to when these people flourished, and but little as to when the Algonkians themselves first arrived and displaced them. There is evident value in any discovery that contributes even slightly to the problem of determining how long this portion of the country has been inhabited. The writer believes that he has found evidence that some tribe, whether Algonkian or pre-Algonkian he does not know, was living in southeastern Massachusetts at least a thousand years ago. The evidence is in the form of numerous stone implements, of such variety as to indicate a probable village site, lying scattered widely over a surface that is now covered by a deposit of several feet of salt-water peat.[1]

Grassy Island in Taunton River is the site of these deposits. It is in the town of Berkley, in a shallow broadening of the river called Smith's Cove, which lies between that town on the east and Dighton on the west. The southerly projection of Berkley, a peninsula two miles long between the Taunton and Assonet rivers, is known as Assonet Neck. This place is noted as having been, together with Mount Hope in Bristol, Rhode Island, the

[1] Abner Morse, in Traces of Ancient Northmen in America, 1861, describes ancient hearths found under four feet of peat on Cape Cod. If he was correct as to their nature, they seem to give evidence of another inhabited site at about the same period as that of the one here described, although there is no need to accept his assumption that they were constructed by Northmen.

last land retained for their own exclusive use by the Wampanoag Indians; also, as being bordered by extensive salt-grass meadows which were the first source of hay for the early settlers in Taunton; and, finally and most widely, as the location of the famous inscribed Dighton Rock, situated near its northwesterly corner on the edge of Smith's Cove. The island is about fifty-six rods north of this rock.

Since 1640, when Grassy Island was first assigned to an individual owner as of value for its hay, the deeds conveying it have always described it as comprising three acres, "more or less," although at the present time it contains but little more than an acre. It is roughly triangular in shape, with a length of about 550 feet and a greatest width of 260 feet. It is entirely submerged at the highest tides, and its level surface is covered wholly with salt-marsh growths, underneath which there is peat overlying what was once doubtless an exposed surface before the peat-growths began, but which is now exposed only at low tides along the edges of the island where the peat has washed away. This "ancient surface," as I shall call it, is sandy, and, in places, somewhat stony soil, sloping slightly downward toward the south at the rate of about one foot in 200; and thus, while the depth of peat above it is five feet at the southerly end of the island, it is only about 2½ feet at the northerly end. Along the westerly and most exposed edge of the island, erosion by tides, storms, and fiddler crabs, continually but slowly weakens and undermines the peat, so that from time to time sections of it split off and are washed away, leaving the remaining edge of peat almost vertical with a sandy beach at its foot, where the line of junction between ancient surface and later peat-growth is clearly marked. The general appearance thus produced can be seen in the first two of our illustrations.

My attention was called to this island by a report that a pocket of Indian relics had been found there some fifteen or twenty years ago, from which something like a bushel of specimens had been removed. During the last seven years I have made occasional visits to the island, about seventy-five in all, at favorable periods of low tide, and have secured numerous specimens

from the beach and by excavation underneath the peat along the exposed edge. I made an attempt to mark off the excavation work into measured sections and thus to definitely locate each find, but shortly abandoned it, partly because of the difficulty of maintaining stakes subject to the wash of tides and sure to be broken by ice in the winter, and largely because there appeared to be little or no significance in the relative positions of the objects found. Apart from those already washed out and picked up from the beach, these were all discovered lying upon the ancient surface and to a depth of some nine inches below it, scattered irregularly about through a length of about 300 feet and a width extending as far as excavation was made, which in some places reached to as much as fifteen or twenty feet. The impression produced was that of a village or encampment site, where in the course of time numerous articles were left about in a haphazard manner, or thrown away when broken. This interpretation is strengthened by the character of the artifacts, many of them being such as would naturally occur, at least in such numbers and variety, only at a place of residence,—such as mortars and grinding-stones, and likewise very numerous chips, cores and unfinished pieces indicating a place of manufacture. A considerable length of occupation seems to be attested by the number of articles accumulated on the site, and perhaps by the depth to which some of them lie buried. It is impossible to form any idea as to the actual extent of the occupied area, inasmuch as only about 1000 square feet of it have been uncovered, which is probably a very small proportion of the whole. For this reason the objects thus far discovered may be far from adequately representative of the character of the culture there exhibited.

A large number of chips, flakes, broken fragments, cores, and unworked pebbles of materials used in manufacture, are found everywhere on the site.[2] Besides these, I have gathered approximately 400 artefacts, about half of which were dug out and

[2] In four scattered places, for instance, which were carefully worked over, covering about 42 square feet, I counted 44 unworked pebbles of quartz, one of them over four inches long, 61 quartz pieces that showed some marks of flaking, 7 green shale chips, and 9 chipped objects. Chips and cores, as well as finished objects, were found in considerable numbers as much as 8 or 9 inches below the surface.

observed *in situ*, the rest being from the beach. The accompanying plates exhibit representative specimens of them. About three-fourths of them are chipped objects: arrowheads, spear-heads, knives, perforators. Many of these are shown in Groups A,[3] B, and E (Plates I–III). Most of them are rather small or ordinary in size, only a very few broken pieces having been found which were parts of larger spear-heads. The largest shown are: in Group B, ninth in next to last row, an unusually perfect one of rhyolite, nearly four inches long; in Group E, bottom row, numbers 2 and 4, each about 4½ inches long, and number 3, broken both ends, which must have been a very long one. Beyond these in the same row are pictured two others that were probably long. They are of all grades of skill in workmanship, some of them very excellent, and do not differ noticeably in this respect from the products of later Indian art. There is, however, one respect in which these earlier forms differ from later ones, which is interesting and perhaps significant. The Grassy Island Indians made a smaller proportion of their arrow-heads of triangular shape (Division II of Wilson's classification) and a larger proportion of them stemmed (Division III), than did the later local Wampanoags; and made a very much smaller proportion of them of quartz and a much larger proportion of other kinds of stone, if my observations are representative. There are two localities on or near Assonet Neck where I find numerous arrow-heads in ploughed fields and which I judge to have been inhabited sites, one of them near Grassy Island and the Taunton River, the other across the Neck on the Assonet River side. The following Table shows the

	Number of specimens	Percentage of:			
		Shape II	Shape III	Quartz	Non-quartz
Grassy Island (ancient)	265	17	83	39	61
Taunton River site (Wampanoag)	286	25	75	72	28
Assonet River site (Wampanoag)	612	83	17	89	11

[3] In Group A a few were accidentally included which did not come from Grassy Island: in first row, nos. 2, 3, 5, 6; second row, nos. 2, 5, 9; third row, nos. 1, 5, 9.

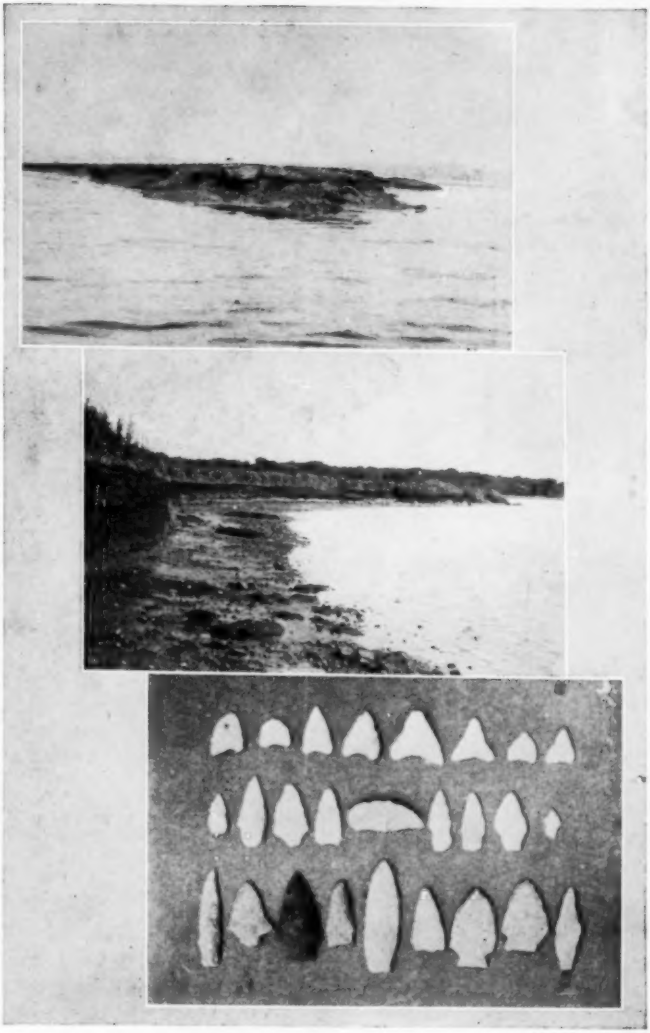

PLATE I

1. Grassy Island from the South.
2. West Shore of Grassy Island, Looking Southward.
3. Artifacts from Grassy Island: Group A.

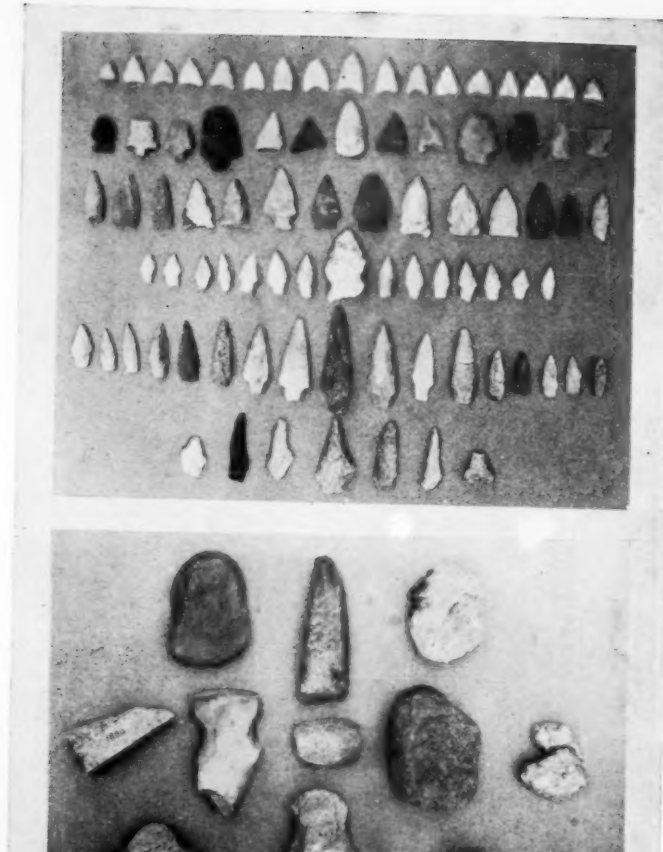

PLATE II
Artifacts from Grassy Island: Groups B and C.

basis for the above statement, and also exhibits a marked difference between the two more recent sites.

About two-fifths of the arrow-heads were made of quartz. The most predominant other material was an attractive looking fine-grained green shale which weathers into a light gray, of which one-fourth of them were made. Rhyolite of various colors and veinings or bandings comes next in frequency of use, comprising one-sixth of all; and the remaining one-sixth includes sandstone, quartzite, felsite and occasional specimens of other kinds. According to Charles W. Brown, Professor of Geology in Brown University, some of these must have come from a considerable distance, as, for instance, from Attleborough, the Boston basin, Marblehead; but in some cases these may have been brought to the neighborhood in the glacial drift, instead of having been obtained in the regions of their natural occurrence.

Among the chipped objects there are fifteen which I take to be perforators or the bases of perforators with their points broken off; and seven of these are shown in the lowest row of Group B. About forty other chipped objects were found that did not seem to be projectiles or perforators, and may have been unfinished pieces, knives or scraping tools. The best worked of these are shown in Group E, first row, nos.1 and 5, second row at end, and in Group B, second row, no. 7. The latter was found six inches below the ancient surface. At least a dozen cores from which flakes had been detached for fashioning chipped objects are among the specimens collected.

The most striking feature of all other classes of artefacts from this site is the extremely crude character of almost all of them; although it must be remembered that the specimens thus far discovered may not be fully typical of the entire culture. With few exceptions they are natural unshaped pebbles showing marks of use, or are very roughly and imperfectly shaped. Only two specimens are grooved: one of them a sandstone "sinker," shown in Group C (second row, no. 3), carefully shaped and with shallow groove all around its longer axis; the other a blunt axe or hammer (C, second row, no. 4), double-edged, symmetrical except that one corner is broken off, very lightly grooved or roughened all around

the middle. Five specimens are notched for hafting, sometimes fairly well (C, second row no. 2, third row no. 2), sometimes very crudely (C, first row, nos. 1, 3). Besides the sinker and well-notched adze, the few pieces which show particular care and skill in workmanship include the following: a gouge (C, first row, no. 2), found standing upright just below the ancient level, with edge smoothly ground and slightly broken, measuring 4 5/8 by 1 5/8 inches, and 7/8 inch greatest thickness; a blunt celt or pestle (D, first row, no. 2), 6¼ by 2½ inches, 1½ inch thick, of gabbro diorite, remarkably well shaped; a hand-hammer or pestle (same row, no. 1), 5 by 3 by 2½, carefully worked into shape; an axe or spade (E, first row, no. 4), 4½ by 3 by 1, tapering in thickness towards both ends; another piece, possibly hoe or spade (same row, no. 3), 5 by 4 by ½ tapering to a thin edge; and a small fragment of a very thin tablet (the smaller piece in E, second row, no. 3), of slate, carefully shaped to a uniform thickness of 4 or 5 millimeters, with delicately rounded edge and tool-marks on edge and body. Next to the last named object is another flat fragment worked on only one side, with a rounded edge. Not more than two or three other pieces besides those just described show a deliberate attempt to modify the natural shape, except sometimes to a very slight degree.

A great many stones, however, show marks of use due to striking or rubbing operations. Among them are a number that seem to be hand-hammers (D, first row, no. 3, second row, nos. 1, 3); some roughly edged tools (axe or adze, E, first row no. 2, second row no. 1); a fragment of a flattened pestle (D, second row, no. 2). Surfaces made smooth and flat by rubbing or grinding processes appear in a considerable number of stones including those shown in Groups C (second row no. 1, third row nos. 1, 3) and E (second row no. 2). Of objects that I have thought might be classed as hammers I have found 19 in all; of axes or adzes 6 or 7; and of what may have been hoes, spades, or possibly cutting tools for other purposes, 5. These latter much resemble the thin blades of which I have found many specimens among the corn-fields of the later Indians and which I take to be hoes; and they may, therefore, indicate that these earlier natives were

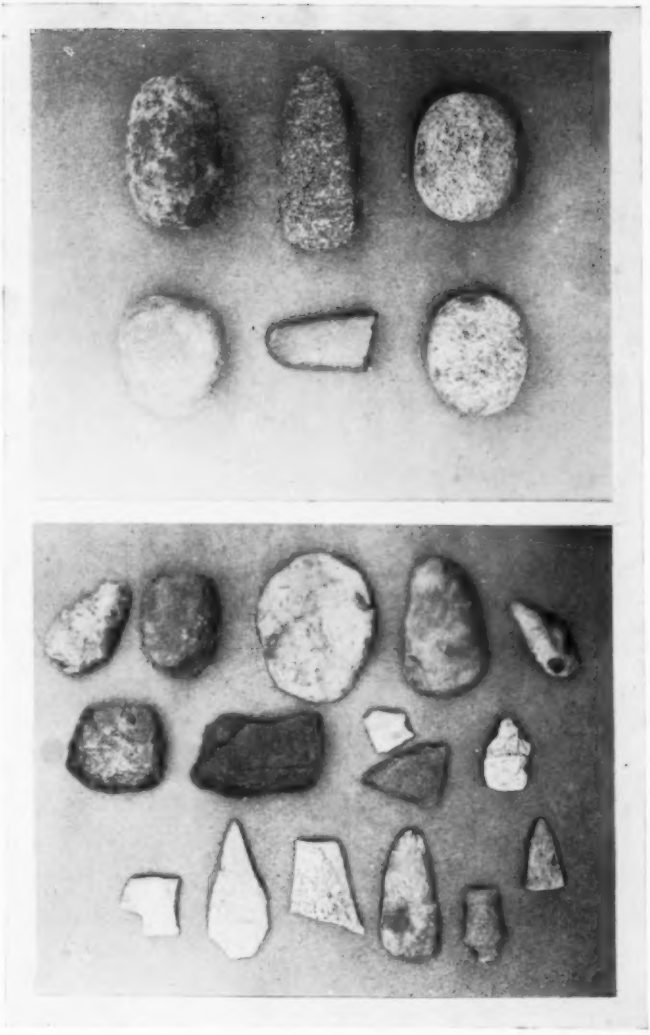

PLATE III
Artifacts from Grassy Island: Groups D and E.

PLATE IV

Mortars and Grinding Stones from Grassy Island.

already acquainted with agriculture. One of them was discovered lying flat two inches below the ancient level.

Of especial interest are the mortar and grinding-stone or muller of Plate IV. The mortar or metate is of sandstone, about 9½ by 11 inches on its upper surface, 6 inches thick at its highest corner and 2 to 3 at its lower end. It constitutes a sloping, not a hollow, grinding surface, one part of which rises at an abrupt angle to a higher level than the other. The muller is of coarse gritty sandstone, 4 by 3½ by 1¾ inches. It was found a hundred feet away from the mortar, but the manner in which it is worn leaves practically no doubt that it was used with the latter. It will be noticed that it has one side worn at a particular angle. When it is turned over, the flat face turned uppermost in the illustration exactly fits the bed of the mortar, and the worn edge exactly fits the abrupt upward slope which divides the mortar into two portions lengthwise, showing that it must have been rubbed back and forth repeatedly in that position. A second mortar was found of about the same size, but with a very shallow hollow on its upper surface.

The object shown in Group C, row two, at right-hand end, is a lump of pure graphite weighing an ounce and a half. The nearest places at which this may have been gathered are Mansfield, Mass., and Cranston, Cumberland, and Tiverton, R. I. A few minute fragments of red ochre have also been detected at various scattered places during the excavations.

The gouge is stained on one edge with sulphate of iron, and Mr. Willoughby tells me that he believes that this is due to its having once lain close to a firestone of iron pyrites in a grave. No other signs of graves have been discovered on this site. Of one broken arrow-head, not illustrated here, Professor Brown remarks: "Heating has destroyed the possibility of recognition of the variety of stone. It seems to have been cracked and charred by fire." In one place, near which were found the graphite, some ochre particles, the gouge and mortars and numerous other objects, I uncovered what I thought may have been a pavement or hearth of stones laid compactly together, measuring about two by four feet. These indications of the use of fire give some slight support

to the evidence offered by the considerable variety of objects and the domestic character of some of them, that this site was actually dwelt upon at a time when its level stood high enough to be beyond the reach of the tides. At one time I thought that certain deep holes in the soil filled with decayed organic material were evidence of ancient stake-holes, but I do not now believe them to have had any connection with human activities.

The chief value of these observations is that they give some clue to the length of time during which New England has been inhabited. It is not very definite, and sets only a minimum limit at best, but so far as I know it is the only indication yet reported. This surface now lies under six feet of water at highest tides, and must have been at least two or three feet above them if it ever was the site of an encampment. In such case there must have been a subsidence of the land of at least nine feet since it was occupied by human beings as a dwelling-place. It is well known that north of Maine the land has risen since it was relieved of the weight of glacial ice; and there are many who believe that there has been a compensatory subsidence to the southward. The rate at which it occurred is still uncertain, and there is difference of opinion as to whether it still continues. Charles A. Davis,[4] who studied the salt-marsh formations near Boston, estimates that the rate of downward movement is the same as that at which the peat growths are built up,[5] and remarks that this "has not yet been determined, but is probably slow, perhaps less than a foot in a century." One observation of my own is pertinent. In front of a house on Assonet River, that was built early in the nineteenth century, I cleaned out a 12 to 15 inch deposit of peat from the beach, and found underneath it numerous fragments of old-fashioned crockery and glass that must have been thrown there

[4] Economic Geology, 1910, vol. 5, p. 623.

[5] These grasses can grow only within certain limits of depth of tidal waters. If a coast-line is sinking too rapidly, the water deepens too fast and peat will not form. Where the latter occurs, therefore, the rate of subsidence cannot have been greater than the rate at which peat can grow; and the argument of this paper, that a certain time at least must have elapsed since the surface was habitable, will hold. If the rate was slower, this time would be longer.

by the early occupants of the house while the beach was bare.[6] This would indicate a peat-growth of perhaps a foot per century, as nearly as can be estimated, which agrees fairly well with the suggestion made by Davis. This is probably, therefore, fairly near to the maximum rate at which subsidence in this vicinity can have taken place, but it does not determine whether it is still going on. Douglas W. Johnson,[7] reviewing evidence bearing upon the matter, comes to the conclusion that there has been no recent subsidence of the coast. The downward movement if it occurred at all ceased some time ago. In the vicinity of Assonet Neck this seems to be true, for the location and acreage of the neighboring salt-meadows was described nearly three hundred years ago, and so far as I can judge by careful estimates there seems to have been no change. Unfortunately none of these data are very exact, and thus we have as yet no sure knowledge as to when the movement of subsidence ceased, or at what rate it had been previously going on. One possibility, however, is that there has been no subsidence since 1600 at least, since the meadows do not seem to have changed since then, and that, if previous movement was at the average rate of about one foot in a century, the habitable character of the ancient level of Grassy Island on and beneath which these relics lie ceased some nine hundred years before that date.

This estimate, it must be acknowledged, will not be accepted by all of the best authorities. John R. Freeman, for example, believes that bench marks and other data in the vicinity of Boston afford conclusive proof that subsidence is still in progress at the rate of about a foot per hundred years.[8] If this be a correct interpretation of the facts, then the minimum time of our calculations would be somewhat shortened. On the other hand, Johnson argues that all of the supposed proofs of land sinking within historic

[6] The beach was bare at first, I assume, because the current naturally sweeps strongly against the shore at this place; but a wharf was built at one end of this beach, probably not far from the year 1800, and a division wall of large boulders at the other end, thus producing conditions favorable for the growth of the grass.

[7] Scientific American Suppl., No. 2168, July 21, 1917; and Geogr. Rev., 1917, iii. 135.

[8] Report of the Committee on Charles River Dam, 1903, pp. 529ff.

times are open to criticism and may be given alternative explanations, whereas the physiographic evidence can be explained only by postulating long-continued coastal stability. Professor Brown suggests to me that, if he is right, our site may have been a winter encampment on the surface of the frozen marshes, and that the stone artefacts left there gradually sank down through the peat to their present level. It seems far from likely that any people would have chosen to encamp, especially for as long a time as is indicated by the number and variety of our specimens, on a position so exposed to wintry blasts, when there are sheltered valleys close by, and from which they would have had to go some distance for their fuel and drinking-water, unless they used blubber and melted ice for these purposes. It seems impossible, moreover, that they could have occupied for long-continued dwelling a position that is only a small island whose surface is submerged sometimes under three or four feet of water when tides rise to their extreme height. However, even if this possibility represents the correct opinion, it must have taken a very long time for all of the stones to sink down through the peat, and we should still be justified in assuming an ancient date for the occasion of residence there. Another suggestion by Professor Brown, that there may have been slipping clays underneath our implement-bearing stratum, whose displacement submerged the original level of the latter and permitted a growth of peat above it, again avoids the hypothesis of a general coastal subsidence but seems to involve our original estimates of antiquity, based upon a probable rate of peat-growth whose formation was complete, as we know, as early as 1640.

Leaving the geologists, as we must, to settle this question as to subsidence or stability themselves, we may conclude that the discoveries at Grassy Island, taken by themselves alone, are at least most easily accounted for on the assumption that there were Indian tribes living in New England at a time when the soil level underneath the peat of this island was at least nine feet higher than it is now, and that this cannot have been later, and may have been an indefinite time earlier, than about a thousand years ago. If Abner Morse's "hearths" were also due to human agency,

the habitat of these people extended at least as far as Cape Cod. So far as can be judged by the specimens of their handiwork already gathered, there is no evidence of any particular relation of their culture to that of the Red Paint people. They seem to have been expert in the manufacture of chipped objects, took pains also sometimes, at least, in shaping gouges, sinkers, pestles, hoe-like implements, and possibly tablets, but contented themselves with the crudest kind of other tools. These latter were used for various cutting, pounding, rubbing and grinding purposes, and were naturally shaped stones with a minimum of retouching, and, when necessary for hafting, with roughly made notches or rare and exceedingly shallow grooves. We know nothing further about them except that they made use of fire and of both red and black paint, and probably engaged in agricultural operations.[9]

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[9] Since this paper was written a few further objects have been found, including two broken pieces of long spear-heads, a small fragment of a second gouge, and a curved fragment that looks as if it might have been part of the bottom and side of a stone pot.

DEBTOR AND CHATTEL SLAVERY IN ABORIGINAL NORTH AMERICA

By WILLIAM CHRISTIE MACLEOD

THE facts as to debtor slavery and chattel slavery in aboriginal North America are of considerable interest to economic history, yet they have been somewhat slighted. A survey of the data will no doubt be of interest and value.

Debtor Slavery

Le Jeune, in 1639,[1] wrote of the gambling of the Algonkian met by him in the region of Quebec:

> I have seen a savage woman who, having lost all she had, staked herself—not her honor, but indeed her services—that is to say, she would have been a slave or servant of the winner if she had lost. They say that it sometimes happens that when men or women stake themselves, he who wins them keeps them one or two years and employs them in fishing, hunting or in minor household duties; then he gives them their liberty. The savages *may not exercise severity, nor harshly exact a service from their countrymen.*

Lescarbot,[2] concerning the gambling of the Micmac specifically, wrote that men sometimes staked their wives, but at the cost of their self-respect, for:

> True it is, as to women lost at play, that to hand them over is full hard, for often they make mock of the gambler, and point the finger of scorn at him.

Roger Williams, speaking of the gambling of the Narragansetts and their neighbors[3] affords an interesting additional note on New England gambling:

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[1] The Jesuit Relations, v. 16, p. 201. (The italics in this paper are my own.)

[2] M. C. Lescarbot: History of New France, (Biggar, H. P., ed.), 1907, v. 3, p. 197.

[3] R. Williams: A Key to the Language of America, Proceedings of the Rhode Island Historical Society, v. 1, 1827, p. 146. In this doggerel verse the author moralises (p. 147) to the effect that "Our English gamesters scorn to stake, Their clothes, as Indians do, Nor yet themselves; alas, yet both, Stake souls, and lose them too."

J. Carver, Travels, (1766), 3rd. ed., 1838, p. 228, observes of the gambling of the natives of the western Great Lakes region that they gamble away "sometimes even their liberty."

When they have staked and lost their money, clothes, house, corn, and themselves (*if single persons*), they will confess [to the evil of gambling], ready to make away with themselves, being weary of their lives.

Choctaw[4] practices were similar to those of New England:

When they are very much excited they wager all they have, and when they have lost all, they wager their wives for a certain time, and after that wager themselves *for a limited time*.

Of the Carolina tribes Lawson wrote, describing their gambling at intertribal festivals and markets,[5] that:

they game very much, and often strip one another of all they have in the world, and, what is more, I have known several of them to play themselves away so that they remained the winners' servants *till their relatives or themselves could pay the money to redeem them*.

So much we are able to gather concerning debtor slavery arising from gambling. Of the servitude of thieves Lawson writes[6] for the Carolinas, that the natives had:

no fence to part one another's lots in their corn fields, but every man knows his own, and it scarce ever happens that they rob one another of so much as an ear of corn, which, if any is found to do, he is sentenced by the elders to work and plant for him that was robbed, till he is recompensed for all the damage he has suffered in his corn field . . . .

Concerning indebtedness incurred in ordinary commercial transactions Lawson notes certain peculiar practices. He states that if a man dies in debt his widow is not required to pay anything of the debts, unless she is willing. This is not surprising, inasmuch as the wife presumably did not have any share in her husband's property interests. But strangely enough this freedom from obligation lasts only so long as the widow does not remarry, for "whosoever takes her to wife pays all her husband's obligations, though ever so many"; and if a man merely "court her for a night's lodging and obtain it, the creditors will make him pay her

[4] J. R. Swanton (*ed.*): An Early Account of the Choctaw Indians, (?1715), Memoirs of the American Anthropological Association, v. 5, 1918, p. 68.

[5] J. Lawson: History of Carolina, 1714, p. 287. Lawson also notes that "They never differ at gaming, neither did I ever see a dispute about the legality thereof ever so much as arise among them."

[6] Lawson, p. 292. On page 329 he observes of thieves that "they are slaves until they repay the person."

husband's debts." Peculiarly, furthermore, if a man takes a widow thus laden with her husband's debts, she seems to have some of the attributes of a chattel, although also a wife. Her husband may,

"if he will, take her for his money paid to her deceased husband's creditors, and sell her to another for his wife. I have seen several of these bargains driven in a day; for you may see men selling their wives as men do horses at a fair, a man being allowed not only to change as often as he pleases but likewise to have as many wives as he is able to maintain."[7]

For the coastal regions of Washington and Oregon—Puget Sound and the Columbia River, etc.—Gibbs writes:

If one Indian has wronged another, and failed to make compensation, or if a debtor is insolvent, he may be taken as a slave. Their mode of procedure is characterized by their wonted deliberation. The plaintiff comes with a party to demand satisfaction, and holds out to the other the option of payment or servitude. If no satisfaction is given he must submit, unless he is strong enough to do battle. And this slavery is final degradation. The rule of once a slave always a slave extends so far that if the debtor should have given up some relative in his power, and subsequently redeems him, he becomes his slave in turn. If a man purchase his father or mother they become his slaves and are treated as such. . . . . Even if one purchase his [own] freedom he is yet looked upon as an inferior.[8]

Parker for the same region[9] noted that persons are made slaves when "taken in payment of debts, if they are orphans of the debtor"; and that persons "sell themselves in pledges." While for this region Swan wrote[10] concerning gambling that:

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[7] Lawson, p. 114. For New England, on commercial debts, we have only the note of Williams (*op. cit.*, p. 45) that "it is common for a brother to pay the debt of a brother deceased." P. Jones: History of the Ojibway, 1861, p. 109, notes concerning liability for payment of blood money, that this falls on the murderer and his relatives, and that the amounts are usually such that these persons may have to labor for years in order to pay up. Equivocally enough, he notes concerning the murderer himself, that "This is, in fact, a sort of servitude, for the murderer is not his own, having to exert himself until the injured parties are satisfied."

[8] G. Gibbs: Tribes of Western Washington and Northwestern Oregon, (Smithsonian Contributions, 1877), p. 188.

[9] S. Parker: Journal, 1846, p. 156.

[10] J. G Swan: The Northwest Coast, 1869, p. 156. H. J. Spinden: The Nez Percé Indians, (Memoirs of the American Museum of Natural History, v. 2), says of the Nez Percé of the adjacent plateau that "it is said that women could gamble away their freedom, but men were not allowed to do this."

There was apparently method in the madness of the Indian gambler. Father De Smet wrote for the "Flatheads" or the Indians of the plateau generally, in the

I have known them to sell themselves as slaves *for a term of years*, or till another chance enables them to pay up their debts.

A note by Kroeber on the area embracing northwestern California and southwestern Oregon makes clear the fact that in this region at least a debtor may be made a chattel slave; and makes clear our other references to debtor slaves redeeming themselves. Kroeber writes:

Slavery occurred in northwestern California as a result of any unpaid debt. It did not matter whether an obligation were wilfully incurred or not, since the law of the region consistently ignored intent. I remember a case of a man who in firing brush had burnt up secreted property of another man, and being poor was unable to effect compensation except by going into slavery. He *was later given in part payment of a blood settlement.* This was after the whites came, but in order to free himself of any claim or vengeance from his master he arranged to free himself by turning over to the latter his wages received from working for a white man for a specified period.[11]

Under the category "debtor slavery" we have now offered instances of servitude resulting from the staking of the person of oneself, one's wife, or one's dependents, in gambling; the selling of oneself for a lump sum of money; the pledging of the person of oneself or of one's dependents as security for a debt incurred through the ordinary commercial transactions, or incurred as a consequence of theft or of injury, intentional or unintentional, to another's person or property. Debtor slavery arising from one source or another appears as widely distributed throughout both agricultural and non-agricultural, stone age,

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region of the upper Columbia, that in gambling: "After losing their goods, they would stake their own persons; at first playing for one hand, then for the other; and if the game continued unfavorable to them, they played successively for every one of their limbs, and lastly for their head, which, if they lost, *they, together with their wives and children, became slaves for life.*" (Journey, in v. 27, p. 171, of Thwaite's Western Travels.)

[11] See A. L. Kroeber: Handbook of the Indians of California, (Bulletin 78 of the Bureau of American Ethnology, 1925). The above is quoted from a letter to the writer by Dr. Kroeber. H. H. Bancroft: Native Races of the Pacific States, v. 1, p. 253, refers to men staking their wives, in gambling, in northwestern California. In northwestern California furthermore we have the practice of making illegitimate children,—that is, those born of parents whose marriage has not been sanctioned by the exchange of a bride-price and its equivalent dowry,—lifelong slaves of some male relative of the mother.

North America; no doubt further intensive research would make it appear more widely distributed than it is possible at present to indicate. Curiously enough, we may here note, that, while debtor slavery resulting from the pledging of the person obtains on Puget Sound and southward including northwestern California, there is no note of it for the peoples of the North Pacific Coast north of Puget Sound. Yet these northern tribes had the passion for gambling pertaining to all Indians, and were quite as mercenary as their southerly neighbors. Moreover, for the important Kwakiutl group we have abundant data on the pledging of things other than the person in commercial transactions. It may be that the better social integration of the northern coast tribes, and the development of the potlatch, with its public exhibition of the shame of the poor and the indebted, affording psychological compensation to the creditor, may have inhibited the development or diffusion of debtor servitude; on the other hand it is possible that debtor slavery obtained but has not been noted in our accounts of the life of the northern tribes.[12]

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[12] One Tsimshian tale would indicate that a man might stake his wife and children in gambling. See Boas, F.: Tsimshian Mythology (1910-1911, 35th Annual Report of the Bureau of American Ethnology). But Curtis writes for the Kwakiutl that when a debtor could not pay up he kept borrowing from the creditor to meet the interest on his debt interminably; of course, as the debt increased the debtor's shame increased, while the creditor is given, in the potlatch, credit for his outstanding credits and is able to use them by transferring them in the purchase of a copper through the operation of a primitive sort of clearing house. (See Curtis: The North American Indian, v. 10, 1910; W. C. MacLeod: A Primitive Clearing House; American Economic Review, Sept., 1925 (in press).) But these notes were made after the Europeans had abolished forced servitude in Canada; however, Dawson (The Queen Charlotte Islands, 1879 Report of Progress, Geological Survey of Canada, p. 129) describes Haida gambling without note of gambling away of the person, and elsewhere describes Haida chattel slavery. We may have in the following a reminiscence of debtor slavery among the Kwakiutl. Boas writes that the pawning of one's name is called *qaqaoxc*—"selling a slave." Curtis says that when a man wished to pawn the name of his daughter he says to the prospective lender, "I wish you to take hold of the foot of my daughter," or "I wish you to buy my daughter to be a slave." (See Curtis, *op. cit.*, p. 144; and Boas, F.: Secret Societies of the Kwakiutl, U.S. National Museum, Annual Report, 1895, p. 346.) Among the Tsimshian a person might be enslaved, or condemned to death by sorcery, for sacrilege during the winter ceremonials. (F. Boas: First General Report, British Association for the Advancement of Science, 1889, p. 832.)

Chattel Slavery

Hereditary chattel slavery was a conspicuous trait of the culture of the non-agricultural North Pacific coast where it has been noted for a continuous area from the Aleutian Islands to northwestern California, inclusive. An active intertribal slave trade was carried on. On the margins of this area—on the adjacent plateau, tundra, and desert, and in the mountain valleys of California—the institution becomes merely the non-hereditary enslavement of prisoners of war.[13] The proportion of slaves to the total population has been variously estimated at from one-twentieth to one-third, varying, apparently, with the conditions of life of the villages along the coast; the proportion decreased under the influence of European culture, and slavery disappeared altogether with Canadian and American prohibition.[14]

In agricultural America slavery was not hereditary. Slaves were merely captive men, women, and children who were either waiting adoption or were not adopted. Of the Choctaw[15] we read:

> When they capture any young people, girls, women, or young boys, alive, they carry them to their villages and make slaves of them. There are nations which adopt them as dogs; they make them perform all the functions of a dog, guard the doors, growl when anyone enters or goes out, eat the leavings of the dishes, and gnaw the bones.

Bartram noted the abjectness of the slaves of the Creek, neighbors of the Choctaw:

> In observing these slaves we behold at once in their countenance and manners the striking contrast betwixt a state of freedom and slavery. They are the tamest, the most abject creatures, that we can possibly imagine; mild,

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[13] H. J. Nieboer: Slavery As An Industrial System, The Hague, 1900, has some worth-while discussion of the slavery of this area. My observations are based on a particular study of the slavery of the North Pacific which I am presenting elsewhere, separately. At present it is difficult to exactly delimit the area of hereditary slavery.

[14] One-twentieth in John Work's census for the Kwakiutl. (See Curtis, *op. cit.*, v. 10, p. 303.) Gibbs, *op. cit.*, p. 188, says that it was about one-tenth on the Sound and the Columbia, but was larger north of the Sound. Simpson, G.: Narrative, 1841, p. 125, for the Tsimshian region particularly, estimated one-third as the proportion.

[15] Swanton: Early Account, (?1715), p. 63. Lawson, *op. cit.*, p. 327, notes that in the Carolinas the term for slave means "that which is obsequiously to depend on the master for subsistence," and is applied alike to pets, domestic animals, and slaves, generically.

peaceable, and tractable; they seem to have no power or will to act but as directed by their masters; whilst the free Indians on the contrary, are bold, active, and clamorous. They differ as widely from each other as the bull from the ox.

In describing the *miko* or village civil chief of the Cuscowilla Lower Creek or Seminoles, Bartram describes the chief's retinue:

He has been a great warrior, having then attending on him as slaves many Yamasee captives taken by him when young. . . . They were dressed better than he, served and waited on him with signs of the most abject fear.

Of the non-hereditary character of Creek slavery Bartram observes:

The slaves, both male and female, are permitted to marry amongst them. Their children are free, and considered in every respect equal to themselves but the parents continue in a state of slavery as long as they live.[16]

The male slaves referred to no doubt included some boy captives matured. But, clearly, among the southern tribes as among the Iroquois far to the north, among whom agriculture was of somewhat less importance, male captives were sometimes enslaved rather than adopted or burnt, and used in field work. That these male adults might not run away, sometimes the Iroquois, as did the southern Indians, would mutilate the feet of these slaves, impeding their movement and making their footsteps identifiable.[17]

Descriptions of Iroquois life further illustrate, probably not only Iroquoian slavery, but that of the Eastern Woodlands in general.[18] Among the Iroquois, captives were sometimes burnt in

[16] W. Bartram: Travels, 1791, pp. 181, 185-186, 213.

[17] For a 1540 account of the crippling of slaves by cutting either the tendons of one foot or one heel see Garcilasso's La Florida, Dec. 1, lib. 3, cap. 17; Dec. 2, lib. 1, cap. 11, and lib. 2, cap. 7, lib. 3, cap. 4; in B. Shipp's translation; De Soto and the Conquest of Florida, 1891. This mutilating was apparently general in the southeast, and in time no doubt spread northward. Lawson (*op. cit.*, pp. 53, 93) notes that the Carolina Indians likewise, for the same purpose, "first raise the skin, then cut away half the feet, and so wrap the skin over the stumps and make a present cure of the wounds." He describes a Carolina Indian who had been a captive among the Senecas but had escaped; the Senecas "had cut his toes and half his feet away, which is a practice among them." Of the Chinook of the far away North Pacific Coast, Curtis (*op. cit.*, v. 8, p. 89) notes that "a slave much given to running away was cut on the bottom of his feet so as to make travelling difficult."

[18] The French travelers and missionaries very frequently use "slave" and "prisoner" synonymously *because a captive was in fact a slave* pending possible burning or adoption.

sacrifice; sometimes adopted as members in full standing of Iroquois families. But frequently they were merely made slaves of the living, or slain with a view to sending them to the other world to be slaves of some deceased member of the family into whose possession they had come. Slavery was not hereditary. La Hontan notes:

> Upon the death of a savage his slaves marry the other women slaves and live by themselves in a distinct hut, as being then free, or such as have no master to serve. The children who spring from these marriages are adopted or reputed the children of the nation by reason of their being born in the village or the country. "There is no reason," say they, "that such children should bear the misfortunes of their parents, or come into the world in slavery, since they contributed nothing towards their creation." These slaves take great care to go every day to the foot of their master's coffin, and there offer up some pipes and tobacco as a grateful acknowledgment of their liberty.[19]

Of mortuary killing of slaves, La Hontan notes that male prisoners[20] are, by the council of elders, "commonly presented to such married women or maids as have lost relatives in the expedition, and to those who want slaves."

> Now, if the woman to whom the present is made means that the poor wretch should die, she gives him to understand that her father, her brother, her husband, etc., having no slaves to serve them in the country of the dead, it behooves him to take a journey thither out of hand.[21]

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[19] La Hontan: New Voyages (1705), Thwaite's Edition, Chapter on Manners and Customs, in vol. 2. Compare The Jesuit Relations, v. 43, p. 293 (1656), where we read of slaves "who have become heads of families after the death of their masters, or have married. Although they lead a tolerably easy life they are looked upon as slaves, and *have no voice, either active or passive, in the public councils.*"

[20] Female prisoners "are distributed among the men, who are sure to grant them their lives." (La Hontan, v. 2, p. 505.) Cf. The Jesuit Relations, v. 43, pp. 293, 299, 303, where it is stated that until someone will care to marry them, women prisoners are slaves who are very harshly treated and liable to be killed on the slightest will of their owner, master or mistress.

[21] La Hontan, v. 2, p. 505. Supported also in this by The Jesuit Relations, v. 54, pp. 93-95 (1669), where we read of the Jesuit father who baptised a young woman "of the more influential class" of the Senecas, which woman shortly after died. Despite the protests of the priest the young woman's mother argued for a mortuary killing: "Thou dost not understand. She was a mistress here, *and had at her command more than twenty slaves who are still with me.* She never knew what it was to go to the forest to bring wood, or to the river to draw water. She knew nothing about house keeping." The mother insisted that the priest baptise a sick slave ("one of my slaves") and instruct it how to find the road to the Christian paradise whence the girl had gone, and to serve her there, because the girl would be alone of her family in the Christian paradise.

Slaves were used among the Iroquois not only in agricultural labor, but for gathering firewood—a laborious duty—and drawing water; and used not only in the villages, but as menials, and even as hunters with hunting parties.[22] Foot mutilation, where it was used, would tend to prevent running away from a hunting party; and another factor which tended to prevent running away arose from the fact that as soon as any warriors were taken prisoner:

> their relatives, and the whole nation to which they retain, look upon them as dead; unless it be that they were so much wounded when they were taken that they could not possibly kill themselves. These indeed they receive when they make their escape; but if the other prisoners should offer to return, they would be condemned by their relatives, and nobody would receive them.[23]

This non-hereditary enslavement of captives, with occasional mortuary immolation of slaves, existed westward of the Mississippi, and appears to be linked, in distribution, with the non-hereditary slavery of the western plateau.[24]

Concluding Note

Debtor slavery in one form or another, and chattel slavery, have been shown to have a very wide distribution in aboriginal North America. Further investigations no doubt will show them

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[22] In Lawson, *op. cit.*, for the Carolinas, we have note of a slave being used as a carrier by his master while engaged in intertribal peddling (the case of the Waxaw on his way to the Congaree and Shawnee); and note of a slave doing the hunting for his master when on a journey (the case of the chief of the Eno). Strachey notes that the Virginia village chief, Eyanaco, kept seven members of the broken Roanoke Colony to beat copper for him, which recalls the use of Jewitt by Maquinna, the Nootka head chief, as armorer. (See MacLeod: The Origins of the State, Philadelphia, 1924.)

[23] La Hontan, v. 2, p. 506. Compare Dawson, *op. cit.*, p. 497, on the Haida: "Slaves sometimes regain their freedom by running away, but should they return to their native place, they are generally so much despised that their lives are rendered miserable." In the Jesuit Relations, v. 43, p. 293 (1656) we read that some Iroquois slaves are those who "have fallen into slavery after being the richest and the most esteemed in their own villages, and who receive no other reward from their masters in exchange for the ceaseless labor and sweat than food and shelter"; perhaps unredeemed by their own tribesmen because of cowardice in having been taken alive.

[24] See, for example, Jones: History of the Ojibway, 1861, p. 131; L. de Cessac: Renseignments ethnographiques sur les Comanches, (Revue d'ethnographique, v. 1), pp. 115-116; Bancroft, *op. cit.*, v. 1, pp. 436, 433, 500, 510; Schoolcraft: History of the Indian Tribes, 1851, v. 1, pp. 232. 235; v. 5, p. 210.

to have been even more widely diffused—even universal, perhaps. At present, however, it would seem that such were definitely absent at least among the central and eastern Eskimo, and among the peoples of central California and the adjacent Southwest. Hereditary slavery was very clearly confined to the coast of the North Pacific; it would seem that the area of non-hereditary slavery surrounding this stretch of hereditary slavery is a part of the single, great area of North American non-hereditary slavery.

Our notes on distribution and type suggest the possibility that the hereditary slavery of the North Pacific Coast developed as a result of diffusion from Asia; in such case one might consider the non-hereditary slavery of the greater part of the remainder of North America as a weaker reflection of the same influence. The writer sees *no economic or political reason for the non-existence of hereditary slavery in the agricultural southeast of North America*, considering its existence among the northwestern hunters and fishers. Yet it may be indeed that the hereditary slavery of the Northwest grew up as a further development of the non-hereditary slavery which no doubt originally obtained there as in the rest of North America. We may conceive of the non-hereditary slavery as having arisen through the desire and opportunity of families who had lost bread-winners in war to recoup their labor force by using prisoners—and yet being unwilling to adopt them, at least without a probationary period—which period would tend to become indefinitely long. Psychological changes, involving a tendency to despise the children of those who have lived as slaves, coupled with the development of an active intertribal trade—this latter apparently being especially highly developed among the innumerable fjords and islands of the further North Pacific coast—might be considered as making for the non-adoption of slaves' children, with their ownership by the owners of their parents. The *psychological* development here involved would not necessarily follow on the development of marked social stratification among the freemen, alone, for this social stratification is equally marked in both the northwest and the southeast of North America.

We note, too, that debtor servitude and chattel slavery represent *two distinct lines of institutional evolution*, although both come eventually to be more or less closely woven together in the cultural complex.[25] Possibly one or the other type of involuntary servitude got a start first and set the example which gave cause to the initiation and development of the other. The known distribution in North America of the two types does not warrant any conclusion as to the priority of one or the other.

Finally, we may add that when the actual facts of aboriginal American land tenure are considered in connection with the actualities of aboriginal American slavery they disprove once and for all the widely accepted thesis which Nieboer vainly attempted to prove, that slavery can only evolve where there is an abundance of "free land"; for in aboriginal America, most certainly on the Northwest Coast, all land was held as property and there was no landed property that was not, the state of the arts considered, effectively utilised economically.[26]

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[25] Apparently only on the northwestern coasts of the United States might a debtor be made a chattel slave, whose condition would be hereditary.

[26] Compare my note entitled Superest Ager, in The Quarterly Journal of Economics, May, 1925.

BURIALS IN THE MAYA AREA

BY O. RICKETSON

TO DATE, the archaeological work carried out in the Maya area has been of a more or less sporadic nature. A good deal of exploration has been done and a great many sites have been reported; but exhaustive examination of any one important site is the hope of the future. If these statements are true for the whole field, they may be reiterated with emphasis for the burials.

In examining the literature on Maya burials the most prominent factor is the paucity of material; the second is the great unevenness of the work reported. In one case a writer states that he has entered and examined over one hundred chultuns, of which he found many that had been utilized as burial chambers or as ossuaries; yet in his report only thirty-four chultuns are described, the article concluding with the remark that to "enumerate or attempt to describe the subterranean chambers which furnished no data would only serve to fill up the report with useless matter." It is to be regretted that a brief summary, giving exact numbers, could not have been appended, for it would enable us to state definitely that a given per cent of chultuns were used as burial places in this case. On the other hand, the work of Dr. Gann leaves little to be desired, and he has probably opened more mounds than any other man alive today.

We cannot yet classify Maya burials according to position nor frequency of occurrence in any given area, but we can itemize the various kinds employed. A civilization as highly organized as the one we find in the Maya area must have developed a caste system, and determination of caste distinctions in burials would be a great stride towards a better understanding of the whole culture. At present we can cite almost any type of burial desired, from simple inhumation to burial in complicated vaults, not excluding cremation preceding urn-burial. Our earliest authority, who, unfortunately, writes all too briefly on the subject, does imply that the method of burial was a matter depending on the social position of the deceased.

This authority is Bishop Landa,[1] who writes of contemporaneous customs. On the psychological side, he tells us that the Maya entertained a great fear of death, and that the sole purpose of all their rites was to beg their gods to grant them health, life, and daily bread. The dead were mourned long and bitterly, and it was believed that the deceased had been carried off by an evil spirit. As to the actual burial itself, he states that the mouth of the of the dead person was filled with corn[2] and small stones, the latter to serve as money in the life hereafter. The grave was usually dug beneath the floor of the house, in which case the house was abandoned,[3] or in the yard outside. Pottery idols were placed in the grave, and if the deceased were a priest, his books. It may well be that the grave-objects were characteristic of the rank and occupation of their erstwhile owner; the hot, humid climate, however, has, so far as archaeological work reveals, destroyed every article except the most lasting.

Landa states, further, that people of high rank—this statement alone intimates another, *lower* class—were cremated and the ashes placed in urns. The 'princes' were cremated, but their ashes were preserved in hollow statues of baked clay. As opposed to these two classes, 'rich people' made statues of wood with hollowed heads for their parents. Part of the body was then burnt, the ashes were deposited in the hollowed head, and the latter sealed. The head of the deceased was skinned and stretched over the wood. Those parts of the body left after these operations were then buried,[4] while the statues were preserved with veneration among their idols.

A like custom existed among the Cocom princes,[5] differing only in detail. The deceased's head was cut off, boiled, and cleaned. It was then sawed in half laterally, the front (facial) half being covered with gum modelled to resemble closely the

[1] Landa. 1864. Chap. XXXIII, p. 195.

[2] Called "koyem" according to Landa.

[3] Gann. 1918. p. 85.

[4] Guthe, 1922, p. 318, says of a burial: "No furniture, no trace of a skull, teeth, or of the atlas and axis could be found."

[5] Rulers of Mayapan until the middle of the 15th century.

expression of the man during life. These masks were preserved along with the ash-statues in the 'chapels in their houses.'

It may not be strictly relevant to the title of this paper to insert the religious beliefs of the Maya as Landa records them; but they are given briefly enough and consisted of ideas not unlike our own—a belief in the immortality of the soul and of a life after death. Their Paradise they called Yaxche, "The Green Tree," and their Hell, Mitnal, where the damned suffered perpetual cold, hunger, fatigue, and sickness.

Landa mentions one specific grave, that at Itzamal,[6] in this brief statement: There was

> a large urn with three pedestals, painted with silvered colors outside and enclosing the ashes of a cremated body, along with some of the arm and leg bones, of a marvelous (great) size as well as three worked objects of blue stone.[7]

Landa fails to mention the character of the graves, that is, whether they were merely excavations for simple inhumations or more elaborate stone vaults. We find both types.

Palenque has excellent examples of vaults. Work was carried on at this site by Holmes,[8] in 1895, who introduces Thompson's report with these prefatory remarks:

> The evidence is sufficiently strong that the pyramids and buildings of Palenque were devoted in some measure to mortuary uses, and this too, by the origina builders. Such use would appear, however, to be secondary, if, as we are in the habit of assuming, the temples were the sanctuaries of deities. . . . Yet the discovery by Del Rio[9] of evidence of a burial beneath the sanctuary floor of the Temple of the Cross, of similar evidences by Waldeck[10] in a gallery in what he calls the Temple of the Palace, suggests the possibility that the whole structure . . . may have been erected to do honor to some ruler or religious official whose remains occupied a vault in the body of the pyramid. . . . It was customary, evidently, to build small tombs in the sides of the pyramids, as it was also in Yucatan on the north and Oaxaca on the west.

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[6] Landa., 1864 p. 32, 33.

[7] Gann, 1905. p. 106 describes calcined bones in vases.

[8] Holmes. 1897, p. 206.

[9] Del Rio (Gates reprod. in the Peabody Museum, Cambridge).

[10] Waldeck, 1886, p. iv.

The tombs themselves are described by Mr. Thompson, who accompanied the expedition.[11] These appear in connection with the Temple of the Cross, so near the surface that clearing away the vegetation was sufficient to expose either the wall- or the roof-slabs. They were aligned parallel to the façade of the temple, and Mr. Thompson is of the belief that a thorough exploration of the mound would reveal tiers of tombs on all four slopes. Only one tomb was examined. It consisted of a rectangular room roughly six feet by six feet and seven feet high, well-built of limestone material, probably once finished in smooth stucco. The roof was corbelled—the usual Maya arch—and in the center was a rectangular stone burial-case, formed of smooth-finished stone slabs, the cover-slab lying flush with the tops of the sides. On the cover-slab were found broken votive offerings. The grave contained two skeletons, one of which was lying on its side, with hands and knees drawn up towards its chin; the other was too rotted to determine even its position. The grave contained the usual objects (in this case a number of jadeite beads, a spindle-whorl, lance-heads, a bone bead, a good example of an obsidian knife blade, and pieces of well-shaped earthen cups) besides a small clay figurine that is of peculiar interest because of an ornate head-dress.[12]

At Monte Alban, Dr. Holmes discovered a chamber in the side of a pyramid which he figures and labels[13] as probably a tomb. Its roof consists of two rows of heavy stone slabs leaning together over the midline of the chamber. And the same author states, in reference to the "Building of the Basement Galleries" at Mital that,

> it seems . . . highly probable that the galleries were devoted to mortuary purposes.[14]

In 1923 Palenque was visited by Mr. Blom for the Direccion de Anthropologia of the Mexican Government, who reports that

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[11] Holmes, 1897, p. 207. Maudsley, 1889-1902, vol. IV, p. 27.
[12] Figured in Holmes, 1897, plate XXIII.
[13] Holmes, 1897, p. 222.
[14] Holmes, 1897, p. 271.

there must be many tombs at Palenque, as the whole area north of the Temple of the Inscriptions, as well as Group A, is a large cemetery.[15] He brought back with him descriptions or plans of eight sepulchres. These structures were all of the chamber type, the first being built like a small terrace, the sides walled, the floor of the terrace being the roof of the grave. This sepulchre contained an entrance leading by two right-angled turns to a room where a tomb of flat, worked stones formed a burial-case, much as described by Thompson above.

Sepulchre 2 also contained an entrance corridor, giving into a small chamber with a Maya arch. Two burials occupied this room, one in a rock-lined grave; the other on top of the grave. The skeletons were badly rotted, but there were nineteen teeth, of which all the incisors were filed. In the grave itself there were twelve teeth, two bored for incrustation (in one the pyrite incrustation still remained).

Sepulchres 3 and 4 occurred together. They were in hewn lime-stone graves covered with dirt, the walls of small stones plastered with lime and clay. The easternmost grave contained a small niche in the west wall about opposite the knee of the skeleton, in which was found a clay olla; another olla painted with 'chacloom' was found to the south side: close to it a 'malacate.' There were pieces of bone and obsidian in the grave. Sepulchre 4 was of better construction than its companion. It contained teeth, of which two incisors were bored for inlays; it also had a niche in the western side-wall.

Sepulchres 5, 6, 7, and 8 offer no great variations from those already described. Number 5 had four burials in one room, the tombs themselves of limestone and plaster. The skeletal material had rotted completely, but the fact that one of the tombs was narrower at the south end than at the north would seem to indicate that the burial had been placed head to the north. Mr. Blom states that in all cases where the skeletal remains were sufficiently preserved for observations to be made, the burials lay head to the

[15] Unpublished notes in Mr. Blom's possession.

north.[16] This is exactly opposite to the ten burials inside the mound at Baking Pot, which we will take up later.

The only variation seen in sepulchre 8 is the fact that the bones lay, head to the north, on a low table of limestone blocks with a little raised edge.[17]

In contrast to these burials are those lying at the foot of the Temple of the Cross,[18] to the north of it. These vaults are noticeable as small hillocks. Entrance is effected by excavation which exposes steps leading down into the grave beneath.[19] Mr. Blom states that there are great quantities of these hillocks and that in all probability they cover identical vaults.

There are fewer examples of vaults more or less centrally located in a main pyramid[20] proper than of vaults lying on the outside slope or located without any relation to a main pyramid.

Maudsley[21] describes an opening in the floor of an inner room in the House of the Lion at Palenque. This opening gives entrance to a very steep stairway which descends to a lower chamber devoid of ornament.[22] At the southeast corner of this chamber is an entrance (which has at one time been blocked up) to another smaller chamber, now unroofed and open to the sky.

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[16] Maudsley, 1889-1902, vol. IV, p. 33, says: "To the S. and S. E. of the House of the Lion along the side of the stream and on hill slopes, there is a collection of low mounds containing a great number of small chambers. Two or three of these chambers contain stone tables and some appear to have passages leading out of them to inner rooms."

[17] Also reported by Guthe, 1921, p. 368.

[18] Maudsley, 1889-1902, vol. IV, p. 27, says: "Two-thirds of the distance up the slope (of the Temple of the Cross) were several sepulchral chambers wh'ch had been opened. In one there was a sort of stone coffin of well-cut slabs. The bottom and sides were covered with dark red powder."

[19] Maudsley, *idem*., p. 32, says: "To the north of the Temple of the Sun is another small mound supporting a building . . . . This mound is joined by a terrace to the smaller mound which enclosed the sepulchral chambers shown in Plate XC. The entrance to these chambers was originally from the top of the mound by a flight of steps. . . . . This entrance has been purposely closed with a large stone slab.

[20] The writer distinguishes "mounds" from "pyramids" by position, size, shape, and probable primary purpose.

[21] Maudsley, 1899-1902, vol. IV, p. 33 and plate 90.

[22] Holmes, 1897, p. 188, describes this structure in the Temple of the Beau Relief, which is identical with the House of the Lion.

The other cases of complicated entrances to vaults in main pyramids given by Maudsley are at Menche, in House H,[23] and at Copan,[24] the so-called "Ventanas," of which he reports four. These latter are all long tunnels without stairs; at Menche the situation he briefly describes in twenty-six words:

> Leading down from the outer chamber are two passages with steps, communicating with an inner and lower chamber, which appeared to have been used for interments.

The vault of Copan, described by Galindo, if not used for burials, must have been an ossuary, for he describes the finding of more than fifty red earthen ware dishes and pots, "many of them full of human bones packed with lime," besides other minor objects.[25]

A famous tomb is that in the "Temple of the High Priest's Grave" at Chichen Itza. This was discovered by Mr. E. H. Thompson, but there has never been a published account of it, that we know of. It consists of a shaft forty feet long leading down from the floor of the temple through the center of an artificial pyramid to a natural crevice at the bottom. This shaft is easily ascended or descended, for the stone-work on either side of the shaft is specially cut so that portions jut out, thus affording excellent hand- and foot-holds. There can be no doubt that the pyramid was built over the crevice purposely. The crevice runs off at a sharp angle downward for a few feet and then expands into a natural chamber. The descent here, again about forty feet, requires the use of a ladder. Mr. Thompson discovered a burial at the bottom, and there was some grave furniture accompanying it.

One other vault burial of sufficient interest to be classed as unusual is reported by Dr. Gann.[26] It was in a pyramid situated close to the Rio Hondo, 80 feet high, 350 feet in circumference, and conical in shape. A passage 3 feet square was discovered 17 feet from the top, which led to a stone-faced chamber. Ex-

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[23] Maudsley, 1899-1902, vol. IV, p. 45.

[24] Maudsley, 1899-1902, vol. I, p. 31. Memoirs of Peabody Museum, vol. I, No. 1, p. 11. Stephens, 1841, vol. I, p. 133, p. 144.

[25] Galindo, 1836, p. 545.

[26] Gann, 1918, p. 86.

cavation in the floor of this chamber revealed six artificial strata totaling a depth of 12 feet 2 inches, at which depth were found forty skulls, all of people in the prime of life. Beneath the skulls were twelve flints of chert. Other articles found were: a polished red pottery vase (animal form); cruciform obsidian pieces, and a great many obsidian knives.

The skulls were all in the same plane, neatly disposed in rows. Not one could be preserved. With our knowledge of Maya burials at its present low ebb, how shall the burial of forty heads, all apparently in the prime of life, be explained? Dr. Gann makes two suggestions: secondary interment of skulls only, in which case the absence of the very young and the very old is difficult to understand—or the ceremonial burial of the skulls of sacrificial victims—though the Maya were supposed to have practiced human sacrifice but rarely.

It would have been interesting to know the sex of the skulls; if all are male, the interment of the forty skulls could be conjectured, perhaps, as a last honor paid to warriors killed in a single combat.

Before taking up the less spectacular burials, let us turn for a moment to the conclusions reached by Saville[27] on some burial mounds in the state of Oaxaca, for they have a relation to the burials already described and may throw light on some of the aspects of burials yet to be taken up.

The mounds excavated were burial mounds, though the author states that other mounds in close proximity might well be house sites, primarily. Their general characteristics are summarized under eight heads, as follows:

1. The graves consist of stone vaults, the doors facing west and sealed with large stones.
2. The funeral urns are placed in front of the tombs, on the roof, or fastened to the facade.
3. The vaults are true ossuaries; the absence of grave furniture is noticeable.
4. The bones are painted red. The tombs contain offerings of food and incense. Absence of decorated vessels in the vaults.
5. The presence of filed and inlaid teeth. (The inlay is hematite.)

[27] Saville, 1899, vol. I, p. 350.

6. The burial of decapitated heads.
7. Elaboration of tombs with mural paintings and hieroglyphs.
8. Lack of use of mosaic for decoration as in the Mitla tombs.

The suggestive fact of this summary is that the majority of the above eight characteristics is applicable in some degree or another to reported burials in various more or less distant points of the Maya area. Stone vaults are reported from Palenque,[28] Copan,[29] Tulum,[30] Rio Holmul,[31] and Rio Mopan,[32] vaults used as ossuaries at Copan by Galindo and chultuns used as ossuaries by Thompson.[33] Cysts used for the same purpose rank after inhumation, which Gann[34] lists as the most common form of burial. The painting red of bones has not been reported elsewhere, though Maudsley reported a tomb smeared on the inside with red powder,[35] and a jaguar skeleton with teeth painted red was found at Copan beneath a mound which contained an earthen pot and traces of bone.[36] As for incense, Waldeck[37] states that on opening the subterranean chamber at Palenque he was led to believe that it was a sepulchral chamber because of a very strong resinous smell. The absence of decorated vessels is commented on by Gann in at least one specific case[38] and the presence of filed teeth is reported commonly.[39] So is the presence of decapitated heads.[40] As to the decoration of tombs, it is scarcely reported, unless we admit the chultuns of Labna, where seven out of thirty-four described by Thompson have either stucco or drawn decorations on the wall. Three of these seven decorated

[28] See previous notes.
[29] See previous notes.
[30] Lothrop, 1924, p. 102, p. 91, pp. 97-98.
[31] Merwin. Unpublished notes of an expedition sent out by the Peabody Museum of Harvard University.
[32] Gann, 1900, p. 692.
[33] Thompson, 1897b, p. 20.
[34] Gann, 1905, p. 105.
[35] Footnote 2, p. 9.
[36] Memoirs, Peabody Museum, vol. I, No. 1, p. 24.
[37] Waldeck, 1886, p. IV See also plate XLI.
[38] Gann, 1918, p. 73.
[39] Habel, 1880, p. 32, reports from San Salvador.
[40] Gann, 1918, p. 78. See also footnote 2, p. 3 above.

chultuns can be correlated with the eleven which he positively states contain human bones, and practically all of the 34 chultuns contain artifacts that suggest their ultimate, if not primary use as burial depositories.[41]

The two headings of the eight given above that are least applicable to the Maya area as a whole are number 2 and number 8. The latter need not surprise us, for Mitla stands alone in the great use of "mosaic" as ornamentation; but the placing of funerary urns *outside* the vault is a custom that, from all appearances, is not reported elsewhere.

Turning now to the southernmost extreme of the Old Empire we shall examine briefly the burials northward, to a burial found in Puerto Progresso.[42]

So far as could be ascertained only one grave is reported which contained a stone yoke.[43] This is at Apaneca, San Salvador, where two bodies lying in a grave formed by four porphyritic slabs were uncovered. Near the neck were more than two handfuls of pointed teeth and below these carved pieces of jadeite. The "yoke" was of gray, porphyritic stone, highly polished, and horseshoe-shaped. It was sixteen inches long and fourteen inches across the base, and appears to be of a different nature from the U-shaped yokes found to the North. Blackiston[44] reports many mortuary mounds in the valleys of the Chamelecon and Oloa rivers, in Honduras, usually rising seven to ten feet above the

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[41] The writer has heard the following explanations for the probable uses of chultuns:

a. Cisterns for the storage of water.
b. Storage places for corn, possibly inside a "bush" house which has long since disappeared. Dr. O. F. Dook of the Bureau of Plant Industry states that the collection of carbon monoxide in these depressions might insure against destruction by vermin.
c. Burial chambers; ossuaries.
d. A subterranean chamber where the maintenance of an even temperature would permit weaving of fine workmanship (Panama hats are today woven in cellars and are kept moist).
e. Ceremonial chambers.

[42] Boas, 1890, pp. 350-57.
[43] Habel, 1878, pp. 32-34.
[44] Blackiston, 1910.

ground level. In most cases they were encircled by walls of medium-sized irregular blocks of stone brought from the river, these low walls having slight masses of earth in front of them. The bones were usually rotted badly. In the second mound excavated, a vaulting of cleverly fitted rocks was uncovered, and in it were found several ollas containing jade and clay beads, a large bizarre stone figure, a small face with a peculiar treatment of the beard and an aquiline nose, and a highly polished green mask. At another site near San Pedro Sula, a mound was excavated in which the outside retaining wall was extended so that it covered the whole surface of the mound. The other sites examined were practically all burial mounds along the river banks that were being rapidly eroded. The disconcerting fact here is that these eroding banks show no structural lines whatever, so that any guess hazarded as to their age is out of the question. Similarly the finding of a skull at a depth of twenty feet is equally disconcerting, for this may mean a great age, or a very rapid deposition of alluvium by a river constantly subject to floods.

Turning now to Copan, we find two classes of burials: Tombs or vaults of cut stone, and burials in a mound numbered 36.[45] The tombs may be vaults at the ends of long shafts, or they may be sepulchral chambers. These latter occur in the widest range of localities—two under a level court; one under the steps of mound 32, another under the steps of a ruined house, and five outside the ruins proper. Of these, two occurred in special mounds, while three were in perfectly level terrain, the roof-stones projecting but a few inches above ground. The walls usually have niches, and the vault is the usual Maya corbel. From Tomb 1 were taken two skeletons, four incisors with circular jade inlays, twelve earthen vessels, one of which is the magnificently modelled head of a wolf, now in the Peabody Museum; pottery whistles, shell ornaments, jade beads, bone needles, and the tops of two peccary skulls beautifully carved. This is a rich find, and rather overshadows finds in other tombs, if we are willing to suppose that a horse's tooth from Tomb 3 is an attempt to be amusing on the part of some post-Columbian rodent.

[45] Mem. Peabody Museum, vol. I, no. 1.

The second class of burials, those excavated in 1892 by Mr. Owens in Mound 36, consisted of three dozen skeletons, found in a mound 130 feet long and 30 feet wide, 3½ feet high, and rising very regularly to the center. The surface was covered with large cobble-stones. Excavations revealed cement floors and walls, though these latter were not for supporting a roof. The floor foundations were pebbles. Scattered throughout the mound were potsherds, pots, pieces of bone, obsidian knives, etc. Ash beds with deer bones were noted. Some skeletons had the appearance of being buried, while others were apparently hurled in. Of the skeletons four had teeth either filed or incrusted, and one had teeth *both* filed and incrusted. Jade, not pyrite, was used for the inlay; two skeletons were buried on their back, one with the legs flexed over the abdomen; one was buried in a sitting posture, with the head bent over onto the pelvis; six were buried on one side, with either the hands under the face or the knees flexed under the chin, or both; and two were buried inside a circle of river stones. Burials 25 and 26 were so intermixed that it would seem to have been a secondary burial; and one burial had a rude shelter of four stones built over the skull.

Let us leave the ruins of Copan proper and note what Gordon says of the caverns near there.[46] It does not simplify our subject to do so, for besides a skeleton in a sitting posture, knees at chin, which crumbled into fine dust at a touch, he found, in Chamber 2 of the cave, that he was walking in soft, deep dust which crackled slightly, and upon investigation found that it was a veritable charnel-house of bones, all so badly decomposed as to be absolutely useless for study. Jars had been placed around the walls, but these contained nothing, apparently, but dust. Although the cave showed no signs of fire, he could only infer from the condition of the bones that it had formerly been used as a repository for the ashes of cremated bodies. Then he was lowered on a rope a hundred feet into another cave, and there the only reward consisted in the remains of a badly decomposed skeleton embedded in stalactite formation at the bottom. This may well have been

[46] Gordon, 1898.

the result of an accidental fall from the only opening, which was through a hole in the roof. Besides these extraordinarily unsatisfactory finds, Cave 3 yielded two jars containing charred fragments, which are probably the remains of an infant. The fact that the pottery found was of a type earlier than, though not inferior to, that of Copan does not clarify the situation.

In contrast to these caverns of the Old Empire, Mercer[47] reports that in the caves of the New Empire, his finds do not show any intentention on the part of the population to utilize them as places of continued burial, since in that more arid region the caves are sources of water supply and not a place to be polluted with corpses. At Xhambak,[48] however, he found skeletons whose bones showed no signs of burning, along with mortuary vases, and at the Cave of Actun Coyok,[49] a trench in the cave floor revealed a disturbed mass of potsherds, stones, charcoal, and ashes. The greatest depth of soil above the cave floor was seven inches. This occurred just above a fissure in the natural rock, and here were found pieces of human tibiæ, fibulæ, ulnæ, clavicles, metapodials and vertebrae, and two fragments of femur "split as if for marrow." But the lack of tools and implements lead him to believe that the caves were used merely as temporary places of refuge and possibly for the practice of cannibalism. If his latter belief is founded upon the one find of split femurs it rests on a very slender base. Out of the 29 caves visited, only 13 were of archaeological interest, and only 5 of the 29 contained human bones or fragments.[50]

Thompson's finds are also against the use of caves as burial places. In his first report [51] he states that in none of the cavities examined, of which there were more than a hundred in the Cave of Loltun, did he find the trace of any human remains. In his second report[52] an inscription on a rock led him to believe that it

[47] Mercer, 1896.
[48] *Idem*, p. 34.
[49] *Idem*, p. 130.
[50] Mercer, 1896, p. 160.
[51] Thompson, 1897a.
[52] Thompson, 1897b.

indicated a body swathed in mummy clothes, and that it is also a fact that the innumerable niches and cavities in the caves would be the most suitable place for the deposition of bodies. In ash and refuse filling a cavity of the floor in the Room of Inscriptions he found fragmentary portions of human bones and human teeth filed into curious forms.[53] But on the whole, the evidence is strongly against the use of caves in Yucatan as a usual burying-place. Had it been so, the dense population which must have existed when the Maya were at their height, would probably have rendered these caves archaeological treasure-houses.

Passing on to British Honduras, Price[54] describes a grave at Kendall, on the Sittee River. This consists of a three-sided chamber on the north slope of a mound 28 feet long and 20 feet wide. It is unusual in that slabs of slate are used for the side-walls, as well as for stelae elsewhere in the ruin. This chamber was three feet wide and eight feet long, about 4 feet deep on the inner side, but only 1 foot on the outer, owing to the slope of the mound. As usual, the skeletal material was beyond salvaging, but the grave objects consisted of half a bivalve shell, (jade) a mask, beads and 5 celts, all of jade,[55] small pottery alligator heads, and two circular discs of iron pyrites. A grave similar to this (except for the use of limestone instead of slate) has been reported at Acanceh, Yucatan.[56]

About twenty mounds have been examined by Dr. Gann in British Honduras and the adjacent territory. As a result of his work he lists the modes of burial in their order of frequency, as, first, inhumation, either recumbent or sitting; second, cyst-burials, especially secondary (i.e., as ossuaries); third, cremated remains in funerary vases.[57]

A good example of inhumation is Mound 1 near Corozal.[58] This is a circular mound 30 yards in diameter and from 5 to 6 feet high in the center. It is composed of three layers of rubble and

[53] *Idem*, p. 19.
[54] Price, 1889.
[55] Illustrated in Gann, 1918, plate LXIX.
[56] Breton, 1908.
[57] Gann, 1905, p. 105. Compare Thompson, 1904, p. 7.
[58] Gann, 1914-1916.

two layers of cement. It contained twenty interments very irregularly placed, the burials being in a squatting position with the knees under the chin and the hands over the ankles or feet. Only six burials had objects—a flint arrow head; a flint hook; a pottery spindle whorl; two obsidian knives; a perforated object of mother-of-pearl; a leaf-shaped spear-head eleven inches long; a polished jade bead; a spherical hammer stone; a curved flint scraper (?); a pear-shaped flint, and a casket containing over one hundred teeth.

In this same group a similar circular mound (Mound 4) contained a cyst floored and was roofed with irregular slabs of stone. The presence of bones in circular bowl-shaped vases was all the indication that the mound was a burial mound.

Near Progresso on Lowry's Bight, the same author reports a vase containing a small earthenware bead, a small obsidian knife, and the terminal phalanx of a small finger, and states that

> we learn from contemporary sources that on the death of a beloved child the mother cut off the tip of her finger and buried it.[59]

Near Succotz Merwin reports a circular burial mound ten and a half feet high and sixty-eight feet in diameter; it contained within it rectangular retaining walls. It was built up of successive strata, each stratum following the curve of the mound's surface, much as would the layers in an onion cut in half, the flat part of the onion representing the bottom of the mound. In it was found a burial.[60]

A similar mound was excavated by the writer at Baking Pot, in British Honduras, during 1924. This site was chosen for excavation as being the probable location of ancient Tipu, described by Fuensalida and Orbita[61] and others. No other ruin in the region fulfils all the conditions required; not only this, but the map given in Avendano[62] places Tipu on a *rio grande* (which we may suppose to represent the Belize River) and not on another

[59] Gann, 1914-1916, p. 38.
[60] Merwin, 1909-10.
[61] Means, 1917, Chap. v.
[62] Map. Avendano and Loyola, Gates reprod.

rio grande indicated as lying to the north (probably the Rio Hondo). Means shows Tipu on this latter stream, but he never visited the region and could not know that the Rio Hondo, as its name signifies, is a slow and sluggish stream, while the description by Fuensalida and Orbita distinctly states[63] that they ascended a very turbulent stream with great difficulty—and the Belize River is just such a stream.

The excavation at this site was concentrated on Mound G, which stood in a prominent position on the north side of Plaza III, the highest plaza in Group I. The mound was 5 meters high and 25 meters in diameter. Excavation revealed that retaining walls just below the surface of the mound enclosed a dome-shaped rubble construction in which plaster floors, three in number, followed the curve of the surface of the mound. The retaining walls, themselves curved, averaged less than a meter at the corners (they were rectangular) but at the mid-sides rose to an average of 2 meters. Obviously the construction of this mound was primarily for burials; it is not conceivable that had it originally been planned for a substructure that the three plaster layers forming the floors would have been curved.

In the center of the mound, at a depth of 2 meters, a sepulchre was found with the remnants of a skeleton lying face down, head to the south. This vault was made of hewn limestone 2.6 meters long and 1.3 meters wide, and covered with large flat unhewn blocks of stone. Although the skeleton was badly rotted, shafts of long bones still remained, and the nubbly appearance of the shaft of the left femur closely resembled the lesions of a very virulent disease, like syphilis.[64] The incisor teeth were bored and inlaid with iron pyrite. The grave furniture consisted of two pots, both of black ware, and three-legged. That at the head was incised with a mat design, the one at the feet was plain. Besides these objects the grave contained several jade beads, two small jade ear plugs, a dozen or so diminutive pieces of polished jade (about the size of peas) equally small pieces of pyrites, and four small pieces of worked bone.

[63] Means, 1917, p. 63.

[64] Compare Gann, 1918, p. 62.

Excavation around this vault on all sides, (except the west) revealed nine other skeletons, all lying head to the south, face down, and parallel to the main grave. All were simple inhumation. The entire space excavated to uncover these skeletons, including the vault, was only 4.9 by 5.9 meters. Skeletons 4 and 5 were to the south of the vault, the one directly superimposed upon the other so closely that we must suppose simultaneous burial; neither heads nor teeth of either could be found. Skeletons 7 and 8 lay north of the vault, side by side, but no. 7 grave pierced the second plaster floor, while no. 8 lay just on top of it. On the east of the vault were 5 skeletons. No. 9 lay alone, but nos. 11 and 13, and nos. 12 and 14, respectively, were superimposed, and again we must suppose simultaneous burial for each pair. It may be interesting to note that no. 12 was a woman, with filed teeth; no. 14 was buried directly beneath her pelvis and was a child who still retained its deciduous teeth. Of the others the following points may be noted: no. 8, a female, had filed teeth; no. 7 lay beneath a pile of rock, which covered the right leg and innominate; upon removing the stones, the leg was discovered to have been destroyed, probably by a secondary interment.[65] The other femur, in situ, showed excessive growth of the great tuberosity, and the humerus on the same side was shortened, twisted and with unusually enlarged condylar processes at the inferior end. Burial 7, as already stated, pierced the second plaster floor; the sepulchre (No. 15) lay beneath the third floor; all the others occurred between the first and second. The relatively good condition of all these bones must be attributed to the excellent drainage yielded by these curving floors as well as to the run-off afforded in the fairly steep slope of the mound.

Four other skeletons were uncovered; one lying face down, head to east, a few inches below the surface on the south slope of the mound, and three close together just outside the retaining wall, also on the south side of the mound. Of these one, buried on the back, lacked both pelvis and legs; the next, directly superimposed above the third, also on the back, lacked the left leg

[65] There was no time to explore the rock pile.

though the head of the femur and part of the neck was still in the acetabulum; his right leg was flexed at the hip so that his foot lay close to and above his head. Both of these skeletons were of unusually large size and showed great development of the ridges for muscular attachments. Their skulls showed no deformation. The third skeleton lay on its side directly beneath no. 2, hands drawn up in front of the face and the legs flexed under the chin. This was a typical Maya skeleton, with small light bones and very marked fronto-occipital deformation.

It may be noted in passing that of these fourteen burials only two contained any grave furniture beyond shards. These were the chief in the sepulchre, already described, and no. 13, who had near the head a piece of worked shell, two small cylindrical rolls of bone and pieces of a deformed deer antler. From the trenches around the mound itself great quantities of shards were taken, many of which could be pieced together, and one terra-cotta human figurine about four inches high, of red clay. Spherical hammerstones, showing abrasions at both poles, were fairly common; a half dozen flint knives, spear-heads and picks were unearthed. Near the center of the mound was found the calvarium of a skull, neatly cut to use as a cup or vessel; the bottom of it was much worn, either purposely in order to make it sit on a flat surface or from long use. Besides it was another piece of skull and a splendid example of an obsidian drill, evidently the implement employed to drill the hole that was to be seen in the piece of skull.

Summarizing the work in the Maya area, it would seem that to date the work has been of an exploratory nature, and that the archaeologists who have worked in this little-known field have had neither the time nor the patience to investigate the anthropological side, and in all probability go into the field without suitable preservatives for the very rotted bones.

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THE HOKAN AFFINITY OF SUBTIABA IN NICARAGUA

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INTRODUCTORY

IT IS the purpose of this paper to follow up a valuable hypothesis which Dr. W. Lehmann has recently proposed in regard to Subtiaba, a language now spoken by only a small number of Indians in a village near Léon, on the Pacific slope of Nicaragua.[1] This language is known to us also under the names of Maribio and, mistakenly, of "Orotina" and "Nagrando." Our material

[1] See W. Lehmann, *Zentral-Amerika, I. Teil: Die Sprachen Zentral-Amerikas, II. Band* (Berlin, 1920); see pp. 910-978, which are devoted to Subtiaba and Tlappanec. The close relationship of these two languages was first demonstrated by Lehmann in 1915 (see *Zeitschrift für Ethnologie*, 1915, pp. 1-34).

is due mainly to what Dr. Lehmann could obtain in 1908 and 1909 from an aged woman in the village of Subtiaba (Jiquilapa), but is supplemented to some extent by earlier vocabularies collected by Squier, Don Francisco Arragon (published by the Comte de Charencey), and Berendt (published in Brinton's *American Race*). For a long time the language was believed to be an isolated one, aside from a small enclave (Guatajiguala) further north in the Lenca country in Salvador. But it appeared later that it is very closely related to Tlappanec or Yopi, a language spoken in the state of Guerrero in southern Mexico, on the western border of the Mixtec area. Though what we know of this second language is apparently limited to a vocabulary of 69 words published by N. Léon in 1912, it is quite enough to show at once that Subtiaba and Tlappanec are really only dialects of a single language, differing no more, say, than Cree and Fox or than Ute and Southern Paiute. It is probable that they are mutually intelligible or nearly so. This is surprising in view of the tremendous distance which separates them, though there is plenty of precedent for this kind of distribution in America (cf. Pipil-Nicarao and Nahuatl; Mangue-Chorotega, Chiapanec, and Mazatec).

This Mexican and Central American language is of very special interest to students of the languages and cultures of the United States because of the great likelihood that Dr. Lehmann is correct in his surmise that it is related to certain languages of California. He seems to believe in a special relationship with Washo, of eastern California and western Nevada,[2] but I believe that this specific formulation of the theory is not quite acceptable. Since Dr. Lehmann first observed the remarkable analogy between the nominal *d*-prefix of Subtiaba and that of Washo, Dixon and Kroeber, J. P. Harrington, and the writer have been led, independently of each other, to affiliate Washo with the Hokan group (then consisting of Karok, Chimariko, Shasta-Achomawi, Yana, Pomo, Esselen, Yuman, Chumash, Salinan, Seri, and Chontal or Tequistlateco). The present writer was further led to connect with these Hokan languages a group of languages (Coahuilteco, in-

[2] See pp. 973-975 of *Zentral-Amerika*.

cluding Comecrudo and Cotoname; Tonkawa; Karankawa; and perhaps Atakapa) spoken in northeastern Mexico and southern Texas, along the Gulf of Mexico, and introduced the term "Hokan-Coahuiltecan" for this enlarged group. An examination of Dr. Lehmann's material has convinced me that he is essentially correct, but that Subtiaba and Tlappanec are to be regarded as a southern outlier of the Hokan-Coahuiltecan stock as a whole, not of a subdivision of this group to which Washo belongs in particular. Aside from the *d-* (or *t-*) prefix, which is shared by Salinan and Chumash (San Luis Obispo dialect), and of which reflexes probably exist elsewhere in Hokan-Coahuiltecan, there seem to be no lexical or morphological agreements that would justify our setting off Washo and Subtiaba-Tlappanec against the other Hokan and Coahuiltecan languages. Of the seven lexical parallels that Dr. Lehmann gives between Washo and Subtiaba, four are probably correct;[3] they are noted below. Each of them has other Hokan cognates as well.

In preparing the following list of cognate words and elements in Subtiaba (and Tlappanec) and Hokan-Coahuiltecan I have not by any means made use of all the dialectic Hokan and Coahuiltecan material which is available for comparison, scanty as that really is, but have limited myself in the main to the material which has already been presented in comparative form in other papers.[4]

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[3] These are words for "mouth," "nape," "sun" ("day"), and "frog." His comparison of the words for "tree," "silver," and "elbow" can hardly be correct and are partly due to misunderstandings. Washo *bĕcu* "silver," which he compares with Subtiaba *baxka*, is to be read with *c* = English *sh* and is obviously borrowed from Spanish *peso*. Washo *d-ulsu* "elbow" cannot be compared with Subtiaba *isu*, which Dr. Lehmann inadvertently translates as "elbow." His material shows that this word really means "bone"; "elbow" is *isu-paxpü*, literally "bone of arm." For Hokan cognates to Subtiaba *isu*, see no. 4 of our list.

[4] See E. Sapir, *The Position of Yana in the Hokan Stock* (University of California Publications in American Archaeology and Ethnology, vol. 13, pp. 1-34, 1917), cited as *Yan.*; R. B. Dixon's and A. L. Kroeber's list of Hokan elements which have cognates in Washo and my own similar list in their *Linguistic Families of California* (*ibid.*, vol. 16, pp. 104-112, 1919), cited as *Was.-Hok.*; E. Sapir, *The Hokan and Coahuiltecan Languages* (International Journal of American Linguistics, vol. I, pp. 280-290, 1920), cited as *Hok.-Coa.*); E. Sapir, *A Supplementary Note on Salinan and Washo* (*ibid.*, vol. 2, pp. 68-72, 1922), cited as *Sup.*

It is highly probable that a detailed comparison with such Hokan-Coahuiltecan languages as Seri, Yuman, Chumash, and Tonkawa would disclose a great many additional Hokan cognates in Subtiaba. The orthography has been slightly simplified and normalized, so far as possible, to current Americanist usage in this country. Stress accents have been omitted. A number of phonetic and morphological observations on Subtiaba follow the list of suggested cognates.

I. HOKAN ELEMENTS IN SUBTIABA[5]

A. Body-Part Nouns

1. arm: *paxpu·*, Sq. *pa'pu*, Ar. *pahpa* (probably "thy arm"; *-u·*, *-yu·* is "my," *-a*, *-ya* "thy" in Sub.). Cf. Chim. *-pu* in *h-itan-pu* "arm" (*itan-* is "hand"); Chum. *pu* "arm, hand"; Sal. *puku* "arm."
2. back: *su·-gi·tcu·* "back," *gi·tcu·* (e. g. *gi·tcu·-naxku·* "back of foot"; *gi·tcu·* is compounded of local *gi·-*, see no. 113, and stem *-tcu·* or *-i·tcu·*, hence literally "at rear"), *gi·tca* "behind, back of." Cf. Sal. *t-itcom'* "back," *t-itcomo* "behind"; Com. *semi* "after."
3. blood: *ɛɛdi*, *ɛ'di*, Sq. *e·ti*, Ar. *edi*. Cf. Sh. *axta*, Ach. *axdi*; Kar. *ax*; Yan. *wat'du-wi* "blood," *-wat'-* "red"; S. Po. *hata* "red"; Moh. *ahwata* "blood," Dieg. *axwat* "blood"; Yum. *xwat* "red"; Se. *avat* "blood"; Chon. *awas*; Sal. *p-akata*, *ekata*; Chum. *axuli-s*. Hokan **axwati* ?
4. bone: *i·su·*. Cf. Moh. *isaka*, Dieg. *hak*, Wal. *tyaga*; Sal. *axa·k'*, *(p-)axak* "bone," *k-exakop* "bony"; Chum. *se'*; Se. *itak*; Es. *iya*; Po.[6] *ihya*, *iya*, *iha*, *hiya*, *ya*; Sh. *ak*; Yan. *i'dal-la*. Hokan **ihyaka?*

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[5] Subtiaba forms not otherwise indicated are from Lehmann's material; Squier's Arragon's, and Berendt's forms are respectively marked Sq., Ar., and Br. The following abbreviations are used:

Ach., Achomawi	Com., Comecrudo	Moh., Mohave	Tlap., Tlappanec
At., Atakapa	Cot., Cotoname	Po., Pomo	Ton., Tonkawa
Ats., Atsugewi	Dieg., Diegueño	Sal., Salinan	Wal., Walapai
Chim., Chimariko	Es., Esselen	Se., Seri	Was., Washo
Chon., Chontal	Kar., Karok	Sh., Shasta	Yan., Yana
Chum., Chumash	Karan., Karankawa	Sub., Subtiaba	Yum., Yuma
Coa., Coahuilteco			

[6] I quote different Pomo and Chumash dialects without specifying them in each case.

5. breast: *sosto, socto*, perhaps also compounded as *so·-* in *so·-gi·a* "breast-chain" (qualified elements nearly always precede in Sub., however), Ar. *sosta*. Cf. Wash. *cu·* "breast"; Chum. *usu·i* "chest, heart"; Chim. *h-usi* "breast"; Sal. *icu'*, *ico'* "breast." Further, perhaps, Chim. *cira, ci'ila* "woman's breast, milk"; Po. *sido, cido, ci'do* "female breast, milk."
6. breast (of female): *tci·tci*. If not borrowed, as Lehmann plausibly suggests, from Nahuatl *chichi* "to suckle," cf. Yan. *tc'ik!i* "female breast"; Sh. *itsik* "milk," Ats. *atciska*, Ach. *i'tcit* "milk, female breast"; Dieg. *itcix* "breast, heart"; Ton. *yatcax* "breast"; At. *itsk*.
6a. breast (of female): *d-u·du·-lu·* (or perhaps better analyzed as reduplicated *du·du·-*), compounded as *-du·-* in *ca·-du·-lu·* "suckling," *tca-du·*, *tca·a-du·* "suckling." Cf. Po. *to* "female breasts, milk," also compounded as *-do* in *si-do, ci-do, ci'-do, s-do*, S. E. Po. *ko-do-n*(or *k-odo-n*) "female breasts, milk"; Chum. *k-utet* "woman's breast."
7. ear: *n^{y}aų*, Sq. *nau*, Ar. *n^{y}qwa* ("thy ear"), Br. *nyahu*. Cf. Chon. *icma-ts*; Se. *isło*; Moh. *'amalya*, Dieg. *'ɔmał*; Po. *cima*; Chim. *h-isam*; Sh. *isak*, Ats. *asmak*, Ach. *issat*; Kar. *itiv*; Yan. *mal'gu*, Yahi *man'gu*; Sal. denominative verb *p-esno-, p-esna-* "to hear, listen"; Was. denominative verb *d-amal* (from **d-asmal*?) "to give ear, to hear." Hokan **isama, *isma(l)k-* ? For Sub. *n^{y}-* from *im-*, see Phonology.
8. excrement: *amba* (from **apa*, see Phonology). Cf. Chim. *h-ipxa* "intestines"; Sh. *ipxai* "intestines"; Yan. *p'a-ts!i* "excrement"; Po. *i'pa, apa, ja* "excrement, intestines"; Sal. *p'xat* "excrement, intestines."
9. eye: *si·tu·, si·ta*, Sq. *situ*, Ar. *sita*, Br. *siktu*. These forms are probably to be understood as *si'tu*, which is confirmed by *suxtu·* "eyelid"; cf. also Ar. *tasu-suxta* "eyebrows" (*tasu-* "hair," see no. 12). These two forms suggest compounding: **si-i'tu* (or **sa-i'tu*) "eye" and **su-*(*i*)*'tu*, originally "hair of eyes, eyelashes" (cf. no. 12)? This **-i'tu*, without preceding sibilant element, is in all likelihood actually found in *yi·tu* "tear," contracted from **ya-i'tu* "water of eye"; for compounded **ya-*: absolute *i·ya* "water," see morphology. Cf. Se. *ito* "eye"; Moh. *-i·δo·*, Dieg. *iyu·*; Sal. *t-uwu, t-u·* "face," *u-ca-t* "eye-water, tears"; Po. *ui* "eye," *yu-xa* "eye-water, tear"; Chim. *h-uso-t* "eye," *h-isu-ma* "face," *h-uso-'xa* "eye-water, tears"; Sh. *oi* "eye," Ats. *oiyi*; Kar. *yu-p*; Yan. *tc'u-na* "eye, face." Hokan **isyu*?
10. face: *i·nu·, i·na* ("my, thy face"), *d-i·nu·-lu·* (for *d-* and *-lu·*, see nos. 120, 122), Sq. *inu*, Ar. *ina, inna* "thy face"; stem *i·nu-* shown in *i·nu-mba* "mask" (lit., "face-great"). Cf. Chim. *-ma* in *h-isu-ma* "face" (compounded with *-isu-* "eye," see no. 9); Po. *huma* "face" and, compounded

with *ui-* "eye," *ui-mo, hui-'mo, huu-mo*; perhaps also in E. Po. *mu-su* "hair" (lit., "face-hair" ? cf. no. 12).

11. fat: *d-asu·*. Cf. Yan. *hau-yau, xau-yau* (*-yau-* is nominalizing). Hokan **axau-* ?

12. hair: *t-asu·* (absolute form), Sq. *tu'su*, Ar. *tasu*; compounded as *su·-* in *su·hu* "hair of head," perhaps also as *su-* in *su-xtu·* "eyelid" (properly "eyelashes?" see no. 9). Cf. Chum. *o·c* "fur"; Was. *d-ayuc* "hair"; perhaps also E. Po.-*su* of *mu-su* "hair" (really "face-hair"? cf. no. 10).

13. hand: *nᵛau·*, Ar. *naow-a·* ("thy hand"), Br. *nyau*; Sub. *nᵛ*, as Lehmann points out, seems to result generally from *i+n* (or *m*, see Phonology), e.g. plur. *-inu·* or *-nᵛu·*. Cf. Se. *inol*. It seems better, in view of this comparison, to disconnect Se. *inol* from Hokan reflexes of **iɬali* "hand, arm" (see *Yan.*, no. 23; *Hok.-Coa.*, no. 18; *Sup.*, no. 18, p. 68).

14. head: *ɛlcu·*, *ɛlca* ("my, thy head"), Ar. *ɛlcoe*; Tlap. *ɛlcu*. Sub. (*ɛ*)*tcu·* as stem is clearly indicated in *gi·-tcu·* "on, upon," which contains local *gi·* (cf. *gi·-tca* "behind," no. 2.), hence lit. "at head." Cf. Chum. (San Luis Obispo dialect) *co* "head, hair" (for possibly more remotely related forms, see *Yan.*, no. 169; e. g. Sh. *innux* "hair," assimilated from **is-nux* from **isu-nax* "head-hair" ?)

15. liver, gall: *gi·ko, gi·ka* "liver" (with *g-* prefix), *pu·ru i·ko* "much gall, gally." Cf. Sal. *t-erk, t-iek* "animal's gall"; E. Po. *b-iko* "bitter (with adjectival *b-* prefix? see morphology); Was. *ts-iga-l* "kidney."

16. mouth: *d-a·u·*, *d-a·ų*, *d-ą·u·*, *d-aŋgwa* ("thy mouth"), Sq. *d-ahnu* (= *-ą·u*?), Ar. *d-anwa* (=*-ąwa*), *d-aowa* ("thy mouth"), Br. *d-aghu* (=*-aγu, -ąγu*?). This word, with its evidently elusive phonetics, seems to be properly *-ąγwu, -ąγwa*. Cf. Chim. *h-awa*; Sh. *au*, Ach. *aph*; Was. *-ha-ŋa* (noted also by Lehmann); Po. *aha, ha, ha-mo*; Moh. *'i·ya*, Dieg. *'a·*, Kiliwi *axaa*, Cochimi *xaa*; Chum. *ök, uk, ao-tc*; Ton. *kala*; Com. *xal* "lip"; Hokan **a*(ŋ)*γwa*?

17. navel: *d-u·mi·u·*. Cf. Chim. *h-onapu*; Ats. *ts-up'-dis*; Was. *d-i·p*. Hokan **-unapiw-*? (**-unap-*, with loss of second vowel, assimilated to **-ump-*, whence **-upp-* and **-umm-*, according to language?).

18. neck: *ha·pu·* "nape," *tu·-ha·pu·* "neck," compounded in *a·pu·-nana* "necklace," Sq. *abu-lu* "neck," Ar. *apa* ("thy neck"). Cf. Was. *d-i·bu* "neck" (noted by Lehmann); Dieg. *ipuk*, Wal. *ipuk*, Yum. *epok*; Ton. *hepei*(*a*); perhaps also Sal. *ape-nik* "necklace."

19. nose: *d-a·ko*, compounded in *d-aga-mba* "nose-big, aquiline nose," Sq. *t-a'ko*, Ar. *d-a·hka, d-a·ka* ("thy nose"), Br. *d-akko*. Cf. Moh. *-i·hu·*, Dieg. *-exu*; Es. *h-oci-s*; Chim. *h-oxu*;

Kar. *yufi*; Se. *uuf*, *hif*; Chum. *n-oxc*, *n-ox*; Com. *yax*; Cot. *ya'x*, *yax*. Hokan **yaxu*?[7]

20. tooth: *si·nᵛu·*, *si·nᵛa* ("my, thy tooth"), Sq. *si'mu*, Ar. *si·nᵛu*, Br. *sinnyu*; properly *si·'-nᵛu·*? Cf. Ach. *ilsa*, Sh. *ɛ·tsau*, New River Sh. *k-ilsau*, Ats. *ilsau*; Chim. *h-utsu*; Yan. *k'i-ts'au-*; Chum. *sa'*; Sal. *suluknai* (with inserted plural *-l-* ?).
21. wing: *t-ala·la*, *d-ala·la* "wing," also *t-ala·la* "bat," Ar. *t-alala* "feather." With final reduplication, which is quite characteristic of Hokan (see Chim., Po., Was., Es., Sal.). Cf. Ats. *palala* "butterfly"; Was. *palolo* "butterfly"; C. Po. *lila-wa* "butterfly"; Sal. *t-api-lale* "bat." These Ats., Wash., Po., and Sal. forms are probably derivatives of an old Hokan stem indicating "wing, to flit" (cf. Sub. "bat" above).

B. Animal Nouns

22. frog: *kosta-lu·*. Cf. Was. *ko·da* (noted by Lehmann); Chim. *qâtu-s* (i. e. *kɔ·tu-s*).
23. rabbit: Tlap. *tcuaxi*. Cf. Yan. *dju·wa*; Es. *tcici*. Hokan **tcux(w)a*?
24. spider: *a·xka*. Cf. Ach. *ts-axa*, Sh. *-t-aki* of *kusi-taki*; perhaps also Was. *ts-uku-* of *tsuku-maŋ*; Sal. *l-aka-* of *laka-na*. Ach. *ts-* prefix: Sh. *t-* (*d-*) prefix is illustrated also in Ach. *tsukxa* "blackbird," Ats. *tsokha*: Sh. *duk'i*; cf. also Ats. *ts-up-dis* "navel"; Was. *d-i·p*: Chim. *-onapu* (no. 17). Was. *ts-* prefix is indicated also in *ts-iguguc* "belly": Chum. *akcuu*; see also nos. 15, 52. For Sal. *l-* prefix, cf. *l-ɛ·m* "sky," no. 44.
25. worm: *unᵛu·* (from **imu·*? cf. *nᵛqu* and *inu-*, nos. 7 and 10). Cf. Chim. *hemu-ta*; Sal. *t-imehai*, *t-almui* (these two Sal. forms can hardly be disconnected; perhaps *-l-* of *t-almui* is collective, as frequently in Sal., leaving as stem *-ime-*, *-amui*).
26. ant: *i·xki·* "olosica" (kind of ant). Cf. Sal. *ilkat* "ant" (with collective *-l-*? cf. nos. 20, 25).
27. lizard: *ω·s'n'go·* (*ω·sɴko·*? Lehmann's orthography is not quite clear to me). Cf. Sal. *swakaka*, *cwa·keka'*. Hokan **aswanka-*, **aswa'nka-*? This word seems to be derived from Hokan **aswa(-'n-)*, **iswa(-'n-)* "fish": Po. *ca*, *aca*; Sal. *cwa·-n*, *swa-n*, *cwa-'ɴ*; Ton. *esva-la-n*.
28. louse: *ia·xa*. Cf. Sal. *t-ik'e'*, *ike*.
29. woodpecker: *ɛnᵛu·*. Cf. Sal. *t-enak*. Hokan **inak*?

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[7] This example is very doubtful, as Sub. *da·ko* seems to belong rather with another group of forms, e. g. Arawak *-taki*, *-tako*, Canixana *-taga*, Chorotiga *-talso* (see A. Trombetti, *Elementi di Glottologia*, p. 320).

C. Natural Objects

30. clay, mud: *gu·ba* "clay," *ra·-gu·ba* "dirt," Sq. *gu·ba* "earth," Ar. *guuba·* "earth"; Tlap. *kuba* "hill." Cf. Was. *tsa-kopi* "mud."

31. day, today, sun, moon: *endo*, *endo* "today," Sq. *endo-la* "day-this" (see no. 104), "today," Ar. *endo* "day," *indo-la*, *endo-la* "today"; from **i-nwa* "this day" (see no. 107a; for phonology, see below). Cf. Moh. *anya·* "sun"; Chum. (S. Cruz dialect) *t-anum* "sun"; Sal. *na'* "sun"; Coa. *a·nua* "month." Jere belong perhaps also Po. *la* "sun," *ala-ca* "moon"; Chim. *ala*, *ala* "sun, moon"; Com. *al* "sun"; Chon. *ora*, *kal-ora* "sun"; also Was. *lot* "yesterday" <**(a)lwa-t* "day-that"? Hokan **anwa*, **alwa*?

32. day: *bii·*, Sq. *bi·*, *bi·-lu*, Ar. *bii·*; Tlap. *bihi* (read *bii*?). Cf. Was. *d-i·be* "sun, moon, month," *e·be* "day" (also noted by Lehmann); Moh. *'ipily-k* "hot, day," Dieg. *'upil* "hot"; Chon. *epal* "hot."

33. day: *-ci·i*, *-xsi·-*, *-si* "day" in adverbial compounds *di·ci·i* "yesterday," lit. "that (past) day" (for *di·-*, cf. no. 107), *ga-xsi·-yu*, *ga·-si* "tomorrow," lit. "that (coming) day" (for *ga-*, cf. no. 106; this demonstrative may be identical with Sub. *ga-*, verbal prefix denoting futurity); Sq. *di·ci* "yesterday," *ga-si* "tomorrow"; Ar. *di·ci* "yesterday," *ga·si* "tomorrow, in the morning." Cf. Es. *asi*, *aci* "sun," *asa-tsa* "day"; Chim. *asi* "day"; Sh. *atcaii*, Ats. *assi·yi* "day"; Se. *sax* "sun," *isax* "moon"; Chum. *icau*, *al-ica*, *al-aca* "sun." Ton. *etc-nan* "day"; perhaps also Po. *m-atci*, *m-adji*, *m-itci-l* "day" (for *m·* see Morphology); and Sal. *icxai*, *esxai* "morning, day." Hokan **asi*, **isa* is also found, in all probability, as incorporated *-si-* in Yan. *-si-ri-bal-* . . . *-'a-*, suffixed to numeral stems and indicating "so and so many days (nights) elapse," literally "to have so and so many suns go down and up" (*-ri-* "down," *bal-* "up," *-'a-* causative); perhaps also in Yan. *b-asi·-* "to be yesterday, night" (refers to periodic lapse of time, not to darkness), for *b*-prefix see Morphology.

NOTE TO NOS. 31-33. In comparing these three words for "day," one is led to surmise that Hokan **anwa* (**alwa*) (no. 31) meant properly "luminary, sun, moon," Hokan **ipi* (no. 32) "day (as period of warmth), day-heat" (observe that Wash. *d-i·be* "sun, moon" is derived by means of nominalizing *d-* from *e·be* "day," not reversely), **asi* (no. 33) "daylight, period of solar light." Another term for "sun" is found in no. 46.

34. earth: *u·mba*, *d-umba·-lu·*, Ar. *umba·*. Cf. Chim. *ama*; Po. *amma*, *ama*, *ma*; Moh. *amaṭa*, Dieg. *amat*; Es. *maksa-la*, *matra* (i. e. *maṭa*); Se. *amt*; Chon. *-ama-ts*, *ma-ts*; Kar. *ma-ruk* "land-ward, to shore"; Was. *ŋauwa* "earth" (<**ma-wa*, **ama-wa*; cf. *d-aŋa-l* "house": Sh. *amma*, *ŋi-* "with the

head": Chim. *me-*, *-ŋa-wa* "besides": Hokan **-ma* "with, also," see no. 114). Hokan **ama* "earth, land" may, further be ultimately identical with or related to Hokan **ma* "place, there": Yan. *-ma-* verb suffix "there, at that place," *-madu* "place of"; Chim. *-ma, -mu* suffix for place names; S. W. Po. *ma-li* "there, place"; Sal. *ma-, um-, t-um-, t-uma-* locative prefix "place where, whither." If **ama* "earth" and **(u)ma* "place" are identical, Sub. *u·mba* "earth" and Sal. *uma-* 'place" may be direct reflexes of Hokan **uma-* "earth, locality," while **ama-* may be assimilated from this form; perhaps **amwa* is to be assumed, with *mw* to Sub. *mb*.

35. earth: *ba·i-lu* "on the ground"; Tlap. *bayi* "earth." Cf. Yan. *bi·-wi* "earth, soil" (*-wi* is collective as in *wawi* "house," *'iwi* "firewood"); Sal. (Migueleño dialect) *t-apaiye'* "dust," (Antoniaño dialect) *tc-ayiya* (from **-apiya*; in this dialect *p* often disappears and *p'* becomes '). Hokan **apai-*?

36. fire: *a·gu·, d-a·gu·lu·*, Sq. *ahku* (i. e. *a·ku* probably), Ar. *agu*, Br. *agu*. Cf. Yan. *'au-na*; Sh. *a·wa* "wood," New River Sh. *ga-'au* "wood," Ats. *ahawi* "wood," Chim. *hau-na* "tinder" (from "fire-wood"); Es. *a-nix* "fire" (stem *a-*); Moh. *a'auva*, Dieg. *a·u*, Yuma *au*, Kiliwi *aau*; Sal. *t-a'au'*. Hokan **(a)'awa*.

37. flower, bloom: *di·i*; also *di·i·* "cortés, tree with beautiful white blossoms." Cf. Chim. *atre·i* "flower," i. e. *ate·i*.

38. grass: *d-aca-lu·* Cf. Was. *hos-pi*; Ats. *qussi-dr* (read *xussi-d*?), Sh. *xatsi-d*. Hokan **axwasi*? Perhaps Sub. *-aca* is to be read *-a'ca, -axca*, assimilated from older **-axci* < **-ax"si-*. But *d-aca-lu·* is related to *ma·ca* "green" (see no. 88).

39. leaf: *i·na*, Sq. *i·na*, Ar. *ina*. Cf. Sal. *c-tan'*, plur. *s-tana-nel* (*c-, s-* before consonants is clearly prefixed and may be eliminated as nominal prefix morphologically parallel to *t-, t-*; cf. Sal. *c-ka·k'* "crow": Yan. *ga·gi*); Chim. *hita-xai, tahal-wi*. Hokan **itana*? (Sub. *ina* to be read *inna*, assimilated from **itna*?)

40. moon: *uku·, d-uku·-lu, d-u·xku·-lu·*, Ar. *d-uku*, Br. *d-ukku*; compounded as *-ku·* in *imba-ku·* "one month." Cf. Chum. *axwai* (San Buenaventura dialect), *owai, awai, t-awa*. Hokan **axawa-, *uxawa-*?

41. mountain: *aŋwa, aŋgwa*, Ar. *a·na*. Cf. Chim. *awu, aumi-ya, a·ma*; Po. *d-ano, d-ono, k-ano* (*k-no*); Maratino (J. R. Swanton, *American Anthropologist*, N. S., 17, p. 38) *ka t-amu-gni* "to war on the mountain." Hokan *ʔaŋwa? (for Sub. *ŋw*: Chim. *w*, cf. also no. 16).

42. night: *m-i·du·u·, m-i·du·-lu·* (adjectival derivative in *m-*, cf. no. 123), Sq. *m-idagina* "black." Cf. Coa. *tako·-m* "night," perhaps also Atakapa *te·gg*. Coahuiltecan-Subtiaba **itak(u)*?

43. seed: *ia·ɣa*. Cf. Sal. *ayexteya* (with collective *-te-* infix in older **ayaxaya*, with peculiar type of final reduplication? cf. Sal. *t-icxeplip* "feet" with *-l-* infix from finally reduplicated **-icxepip*), older stem (*a*)*yaxa* probably retained as *ya·ha*, *yaxa* "frijol"; probably also in Chim. *ama-ya·qa* (read *-ya·xa*?) "sand," literally "earth-grains." Hokan **ayaɣa*?

44. sky, above: Sq. *d-ehma-lu*, Ar. *d-ehma* "en haut," Sub. *na-gi·ma* "to mount" (see no. 60; for *g*-prefix of *g-i·ma*, see no. 124); perhaps also Tlap. *mi-* of *mi-xkwi* "sky." Cf. Es. *imi-ta* "sky"; Moh. *ammaya*, Dieg. *ammai*; Chon. *emaa*; Sal. *l-ema*, *l-em*" sky," *l-e·mo'* "over, on, above"; Se. *ami-me;* Yan. *'ap'-sa*; Chum. *al-apa*, *hal-acpai*; Chim. *tc-emu*; Ach. *ts-amiki*; Com. *ape-l*. Hokan **ima* (**i'ma*)?

45. stone: *si·-nu*, *siɣ-nu*, Sq. *isi·*, *isi·nu*, *i·si* "stone, flint," Ar. *si-nu*; Tlap. *istci*. Cf. Kar. *aca* "rock"; Sh. *itsa*; Es. *ciefe:* Sal. *t-cxa'*, *cxap*; Chum. *ɣöp*; Po. *xabe*; perhaps also Chim. *qa·'a*, *kaa* (if to be read *xa·'a*). Hokan **ixa'*, **ixa'-pi* (Sub. *isi·* assimilated from **isa'* from **ixa'*)?

46. sun: *d-aɣka·-lu·*, Sq. *ahka*, Ar. *ahka*, Br. *d-aska*; Tlap. *axka*. Cf. Se. *tahx*; Ton. *taxa-c*, *taga-c* "day"; perhaps also N. E. Po. *-daka* in *maṭi-daka* "day-sun" (though this may belong rather with *da*, *hada* "sun" of other Po. dialects). Sub. *aɣka* is probably related to *na-yaɣka* "to shine," hence *d-aɣka·-lu·* may be properly "the shining body." Hokan **laɣa*(*-ka*) "sun" is, then, perhaps an old nominalized form in *l-* (see no. 120) from a verb **aɣa*(*-ka*) "to shine (of sun, moon)"; **aɣawa* "moon" (see no. 40) may be related to this.

47. tree, wood: *i·ci*, *i·ci·*, *d-i·ci-lu·*, Sq. *i·ci*, Ar. *ici*; Tlap. *itci* "tree." Cf. Chon. *che*, *kal-eke* "wood, tree" (*kal-* is nominal prefix, see no. 106); Se. *che*; Kiliwi (Yuman) *xat-pak*; Po. *ahat*, *hai*, *xai*; Com. *xai*. Hokan **ixai*?

D. Cultural Objects

48. axe, hatchet: *a·ɣwa*, Ar. *ah-nu*; probably also compounded with *si-* "stone" (see no. 45), assimilated to *sa-*, in *sa-ɣ-nwa* (or *s-aɣ-nwa*) "copper, axe (of metal)," *s-aɣ-nwa-lu* "iron, machete," originally "stone of axe, material of axe," hence later "copper, iron" and "axe of copper, iron." Cf. Chum. *owa*, *uwu* "knife" (from **aɣwa*?; cf. no. 40); possibly also Was. *ta·wi*, *ta'wi* "knife" (read *ta'wi*? but *t-* is not here equivalent to nominal *d-*, as is shown by possessive forms like *di-ta·wi* "my knife"). If these Chum. (and Was.) forms are not to be understood as having *-'w-*, they can hardly be compared with Sub. *a·ɣwa*,*aɣ-*, and are more likely to belong with Hok. **awai* "stone" (see *Hok.-Coa.*, no. 51).

49. bow: *d-i·ci·-lu·*. Cf. Chum. *t-axa, ax*; Sh. *xau* (doubtful because ordinarily Hokan *x* appears as Sh. *s*, *ts*, while Hokan *χ* appears as *x*); Sal. *p-axuwe* (same difficulty as for Sh.); Ton. *nixau* (if analyzable as *n-ixau*); Com. *xai*; Kar. *gai*. Hokan **ixai*? (For phonology cf. Hokan **ixai* "tree, wood," no. 47. It is possible that there are two distinct stems here: **ixai*, cf. Sub., Ton., Com., Kar.; and **axau*, cf. Sh., Sal.; Chum. might belong to either. But it is more likely that they go back to one source and that **iχai*, **iχau* was in some dialects shifted to *ixai* because of palatal position of *i-*.)

50. house: *gwa, gwa-lu·*, Sq. *gua* "house, hut," Ar. *gu·a, iwa·*, Br. *gua*; Tlap. *gugua*. Cf. Yan. *wa-wi, -wa*; Chim. *a·wa*; Es. *iwa-no*; Moh. *ava*, Dieg. *awa*; perhaps also Chum. *p-awayic*; Com. *wa-mak*. From Hokan **iwa*, **awa*, **wa*. I prefer to keep apart Hokan **ama* "house" (see *Was.*, pp. 106, 108), though it is quite possible that these stems go back to one source; for Sub. *gw* from *w*, see Phonology.

51. road: Tlap. *is-kamba* "camino real, highroad" apparently compounded of *is* and *kamba* "road" (cf. Sub. *gamba* "road, street"). If *is-* is to be taken as meaning "trail" (Indian trail as contrasted with road?), which is far from certain, it may be compared with Chim. *hissa* "trail"; Yan. *'i·ya*; Ach. *i'de*"; Po. *hida, da* "trail, door"; Tonto (Yuman) *inya* "trəil." Hokan **itya* (**izya*)?

52. shirt: *eme* "camisa de mujer," *me-χnᵛa* "shirt, huipil," *mi·i·da* (=*mi·-i·da*?) "camisa de hombre," Ar. *mi·da-xuberu* "veste de coton." Cf. Yan. *mi-wi, -mi* "hide, blanket"; Tonto (Yuman) *ya-mia* "skin, hide," Yuman *-mi, -me* "hair" in Moh. *'iavu-me* "beard," Dieg. *'ale-mi* "beard" (cf. Moh. *'i·ya*, Dieg. *'a·* "mouth"); Chim. *hima* "hair"; Com. *emo-l* "skin, hair on body"; Sal. *l-emi'* "rabbit-skin blanket" (for *l*-prefix in Sal., cf. no. 44), *cl-emi-y'a* "coat"; perhaps also Was. *ts-ime-l* "beard" (for nominal type *ts- . . . -l*, cf. *ts-iga-l*, no. 15); Po. *ts-i'me* "hair, fur." Hokan **ima* and **ami*, assimilated **imi* "hair, fur, skin, hide, blanket, coat"?

53. string: *u·nᵛu, d-u·nᵛu, d-u·unᵛu, d-u·nᵛu-lu·* (read *unnᵛu*?). Cf. Sh. *imme* "sinew" (from **ipme*), Ach. *pim*, Ats. *ippiu* (from **ipmᵛu*); Yan. *ba·ma* "sinew.) These forms seem to reconstruct to **ipamu*, whence, in Sub. **ipmu*, **immᵛu*, assimilated to *unnᵛu* (cf. nos. 7, 10, 25).

F. Personal Nouns

54. child: *-ku·*, *-ku* in *se-ku·* "child," Sq. *sa-ku-le* "son," *sai-ku-la* "daughter," *ni· ku-yu·* "my son-in-law," *gu·-ku-yu·* "my daughter-in-law" (*-yu·* "my"; *gu·-, -gu* "female," e. g. *gu·-nᵛa·ni* "young woman," *gu-mba* "old female," *ra·ba-gu·*

"woman"); Tlap. *-gui* in *gu-gui* "daughter-in-law." Cf. Tonto *ko-tye* "small"; Es. *oxu-s-k*, *uku-s-k*, *uku·-s* "small, infant"; Po. *-ku* "son, daughter," *ku-* "boy, girl infant," *ku-ts*, *ku-tc* "small," *ku-s* "infant," *kawi* "small, infant, boy"; Chum. *ku-tco*, *gu-nup* "child"; Ton. *-xun* in *ca-xun* "small," *wi-xun* "girl"; Cot. *kuwo-sam* "small, young"; Kar. *kwa·n*, *kwaan* "small, young." Hokan **k'u* "small, child"? Sub. *sɛku·* "child" may go back to **isa-k'u* (see Phonology) and correspond to Ton. *ca-xu n* "small."

54a. man: *r a·bu* "person, man" <**r a·ba-k* (see Phonology, for *r* prefix see Morphology), *r a·ba gu·* "woman" (literally "man-female"). Cf. Es. *efe-hi* "people"; Po. *ba*, *ba-ia* "man." Hokan **ipa-*?

55. mother: *d-u·tu·*, *d-u·tu·-lu·*, compounded as *du-* in *du-ɣi·nᵛa* "mother-old, grandmother," Sq. *autu* "mother," Ar. *d-utu*, *d-uta* ("my, thy mother"); Tlap. *r-utu·* "my mother," *r-uta-lo* "our mother." Cf. Chum. *tuyu*, *tuɟ* "mother"; Kar. *ita*, *ta-t*; Ach. *da-tyi*; Yuman **tai* in Moh. *hin-tai-k*, Dieg. *tai-lᵛ*, Yum. *ta-lᵛe*, Cochimi *ka-tai*; Coa. *tai*; perhaps also Was. *-la*. Hokan **uta-*, **utay-*?

56. sister: *sɛ-ka*, perhaps from **isa-ka* (cf. no. 54). Cf. Was. *-i·sa* "older sister"; Es. *itci* "sister"; Sh. *atcu*, *atci* "older sister"; Ach. *ab-is* "older sister" (*ab-* probably as in *w-ab-aui* "older brother"); Kamia (Yuman) *esan* "younger sister," *intca-tcan* "older sister" (for *intca-* cf. *intca-mal* "older brother"), Cocopa *hidj-isa* "older sister," S. Dieg. *intca-itcan* "older sister," *sal* "younger sister," N. Dieg. *etcan* "older sister," *esan* "younger sister." From these forms Hokan **isa* "sister" may be inferred.

F. Verbs

57. be: *-tsu* in *iku· ci·-ni·-tsu* "I am, dwell" (*iku·* "I;" *ci·-ni·-* perfective, hence properly "I have sat down"). Cf. Yan. *dj t-* primary verb stem "to sit, dwell;" Chim. *-tcu-* "to lie on ground, sleep;" Sal. *-atce-* "to sit" (*k-atce-k* "to sit down," *t-atce-x* "seat"); perhaps also Es. *k-oso-* "to sit down."

58. beseech: *-waa* in *na-waa* "pedir" (*na-*, in this and following examples, is present tense prefix). Cf. Yan. *-wa-*, *-wa·-* secondary verb stem "to weep;" Chim. *-wo-* "to cry;" Ach. *-wo* "to cry;" Coa. *wa·yo* "to cry;" Karan. *owiya* "to cry."

58a. bring: *-g-aya·a*, *-yaa* in *na-gaya·a* "to bring, drag," *iku· gi·-nᵛaa* "I have brought" (properly "I have been brought"? *gi·-* is passive participial) <**-ni-yaa* (*ni-* is preterital), also *-g-a·ya* in *na-ga·ya* "to have, hold, carry" (for *g-* prefix, see Morphology). Cf. Sal. *p-aye-m* "to carry, bear" (for transitive *p-* see Morphology); C. Yan. *'ai-* "to carry." Hokan **aya-*?

59. burn: *-g-amo* (used of fire) in *na-gamo* (for *g* prefix see Morphology.) Cf. Chim. *-maa-*; Ton. *mai*; Com. *-makua*.

60. climb: *-g-i·ma* "steigen" (*g*-prefix as in no. 59); cf. corresponding nominal form *d-ehma-lu* "sky" (no. 44). Cf. Yan. *ma·-* "to climb."

61. come: *-a, -aa* of *na-a, nᵛ-aa* (probably from *ni-aa*; *ni-* is preterit). Cf. Chim. *-a-* "to go"; Yan. *'a-* "female goes." But *iku· ni-naa* "I came" and *iku· ci·-ni-naa* "I have come" seem to indicate Sub. *-naa* as stem; these forms are perhaps remade from present *na-a*.

62. come: *-tca* in *na-tca*. Cf. Yan. *dja-* primary verb stem "to proceed, move" (see *Yan.*, no. 31); Po. *tca, tca-k* "to run."

63. come: *-kᵾ·i* in *na-kᵾ·i*. Cf. Yum. *ki·ri-k*, Dieg. *kiyu*; Coa. *kal*; Karan. *kas, ka's*; as secondary stem also in Yan. *-k'i-* "hither"; Chim. *-k* (e. g. *-wa-k* "to come," cf. *-owa-* "to go"); Was. *-u-k* "toward the speaker" (cf. *-u-e* "from the speaker"); Sal. *-x* (e. g. *ia-x* "to come," cf. *ia* "to go"); Com. *-k* in *ya-k* "to come." Hokan **k'wali* "to come," as secondary stem reduced to **-k'(w)i*?

64. cry: *-mbi·ya* in *na-mbi·ya*; simpler stem *-mɬi, ɛmbi* preserved in *ɛmɬi* "owl." Cf. Yan. *mi·-* "to cry, wail;" Po. *mi-na, mi·-n-wan, mi·-mai* "to cry;" Tonto *mi* "to cry, scream, sigh," Moh. *himi-n* "to cry, lament"; Sal. *'ame-s, ama-s* "to shout, to cry." Hoken **ami*, assimilated to **imi*?

65. die: *-ga-nᵛu·* in *na-ganᵛu·* (for *g* prefix, see Morphology; *-nᵛu·* from **inu·** < *-imak* or **-imax(w)* ?). Cf. Es. *moho* "he died"; Sal. *-ama-* in *c-aм-tet* "corpse," *p-ama-t* "to die," *a·m(k)* "to kill"; Yan. *am'dji-* "to kill"; Chon. *maa-* "to kill."

66. drink: *-nᵛa* in *na-nᵛa* (from **ima*, cf. no. 7). Cf. Wash. *ime* "to drink," nominalized as *d-ime* "water" (from **ima*; Washo *e* regularly results from *a* when preceded by *i*); Es. *imi-la* "sea"; Chum. *ma, tc-l-imi* "stream," possibly also *s-x-ami* "ocean" (note that *ma* and *tc-l-imi* can only be reconciled by assuming **ima*, which is precisely what Sub., Was., and Es. independently lead to). Hokan **ima* "water, to drink"?

67. eat: *-iu* in *g-iu, g-iu·* (intr.). Cf. Was. *iw, eu* "to eat" (tr.); Po. *wa* (with plural object). Hokan **iwa* "to eat" (tr.; ir transitivized in Sub. by *g*-prefix, see Morphology)?

68. go: *-xka, -ska* in *na-xka*, Ar. *na-ska*. Cf. Ton. *xa*; Coa. *ka-l* "to go," *ka-i* "to walk"; perhaps also Sal. *ica, ica·-k* "to go, to walk" (<Hokan **ixa-*?).

69. go: *a·yu, a·ya* "go!" Ar. *a·iya* "to come," Sq. *aiyu* "to go," perhaps also *-d-ia-* "to cause to go" in *na-dia-ma* "to place" (<to cause to go with"?; for *d-*, see no. 125; for *-ma* "with," see no. 114). Cf. Sal. *ia, ie* "to go," *ia-x* "to come"; Es. *iyu* "to come"; Was. *iye* "to walk, go," perhaps also

aya "to move running," *ya-ŋi* "to run (plur.);" Ton. *ya-ku-* "to go"; Karan. *ye.*

70. go: *-g-a·u* in *na-ga·u* "to go," *ci·-ni-ga·u* "ya se fueron"; also *g-a·wi·*, *g-a·gwi·* in *na-ga··wi*, *na-ga·gwi·* "to flee, go away" (for *g-*, see Morphology). Cf. Po. *wa*, *wa-l* "to go, walk"; Chim. *-owa-*, *-wa-m-* "to go," *-wa-k-* "to come"; Kar. *va-r(-am)* "to go"; Was. *-u-* as secondary stem in *-u-e* "from the speaker," *-u-k* "toward the speaker," *-wa-* secondary stem "to go" (e. g. *baaci-wa-a* "he went in"); Ton. *wa-na* "they go"; Cot. *awo-yo* "go over there!" Karan. *wa-na* "go away!" At. *wa-n* "to go." Hokan **awa* "to go away" (note parallelism of Sub. *g-a·u*: Hokan **awa* and Sub. *g-iu*: Hokan **iwa*, no. 67)? From this Hokan stem is perhaps formed also **-awa* as postposition "away from": Po. *-awa* "from"; Was. *-uwe* "from."

70a. lack: *d-a·wa*, *d-agwa* "there is not" (properly "to have lacking"; for *d-* see Morphology). Cf. Sal. *k-awa* "to be lacking"; with intransitive *k-*prefix); Yan. *wɔ·-wai-*, *wa·-wai-* "to miss" (*-wai-* secondary verb stem "to perceive").

71. laugh: *ndiɛgu·* in *na-ndiɛgu·*. Cf. Sal. *ilik*; c. Yan. *'alai-* "(several) laugh."

72. make: *-da* in *na-da*. Cf. Sal. *eta*, *eta'*.

73. peel: *-di·i* in *na-di·i* "to peel (fruits)." Cf. Yan. *dɛ·-*, static *di·-* "to peel, shear."

74. pour: *-ʂkwa* in *na·-ʂkwa* "to pour out, strew out." Cf. Chim. *-qo-* "to pour," *-qox-* "to spill" (read *-ko-*, *-kox-* from **-kwa-*, **-kwax-?*).

75. run: *-g-agnu*, *-agal-* in Sq. *na-gag-nu* "to run," *d-agal-ni* "runner" (for nominalizing *d-*, see no. 120; perhaps better analyzed as *-agalni* with *-ln-* as nasalized *l* or some other variant of *l* or *n*). Cf. Yum. *kono* "to run," Dieg. *ganau*; Was. *igelu* (plur.); Po. *gadi*. Hokan **ikalu*, **ikali?*

76. see: *-ya* in *na-ya-ŋga* (*-ŋga* probably enclitic pronoun "him"), Sq. *da(i)-ya* (*da-* probably imperative prefix), Ar. *da·(i)-ya*. Cf. Moh. *iyu*, Dieg. *ɔwu*. Hokan **ayu* (assimilated to **aya*, *ya* in Sub.)?

77. sit: *-t-a·u* in *na-ta·u* (for factitive *d-*, *t-* prefix, see no. 125). Cf. Yan. *wa-*; Chim. *-wo-* "to sit," *wa-* "by sitting on"; Ats. *we-* "by sitting on"; Tonto *oa* "to sit," Wal. *-ua*, Kiliwi *owau*. Hokan **awa* "to sit" (older Sub. **t-awa* "to make sitting, have as seat")?

78. sit: *-a·mo*, *-a·ma* in *k-a·mo* "to sit" (for *k-*, *g-*, see Morphology), *k-a·ma goo-yu·* "estoy sentado en la casa." Perhaps originally "to dwell" as denominative from Hokan **ama* "house." Cf. Was. *d-aŋa-l* "house," *aŋa-l* "to live"; Chum. *ma-'m* (or *m-a'm*) "house"; Sal. *t-a·m*, plur. *t-ama·-nel*, *t-a·ma·-len*, as denominative verb *k-ɯa·-i* "to live, possess home" (properly "to be housed"); Sh. *amma*. Hokan **awa*

"to sit" (no. 77) may also well be derived from **awa* "house" (no. 50).

79. sleep: Sq. *ami*. Cf. Sal. *me*; Com. *n-eme-l*; Karan. *ɯm*; perhaps also Was. *ma-ca-m* "to lie (sing.)," *maya-c* "to lie (plur.)." Hokan **ami* (**imi*) or **amay-*?

80. sleep: *-apo*, *-apu·*, *-apa* in *g-apo* "to lie (in sleeping)," *na-gapu·* "to sleep" (for *g*-prefix, see Morphology), *iku· na·ɬcu ma-dapa* "I shall sleep" (literally, "I go with sleeping"). Cf. Chim. *po-*, *poi-* "to sleep"; Chum. *k-opok* "dead"; Es. *poko-* "to sleep"; Sal. *p-apa·ɛ* "to copulate" (old transitive in *p-*: "to lie with, have one lie").

81. sleep: *-gu·* in *na-gu·*. Cf. Sal. *kau*, plur. *kaxau*; Chum. *ukwe*. Hokan **ukau*?

82. smoke: *-s'i·χa* in *na-si·χa*, *na-s'i·χa* "to smoke." Cf. Po. *tsaxa*, *saxa*, *saha* "smoke"; Es. *tcaxa* "smoke"; possibly also Yan. *tc'ɛ·kau-na* "smoke"; Sal. *ts'opo* "fog."

G. Adjectives

84. alone: *mi·no*, *mi·na·u* "alone, self." Cf. Was. *mi·le* "all (from **mi·na*? Hokan *n* seems not infrequently to appear as Was. *l*, e. g. *l-* "I" <**n-*).

85. big, fat: *umba* "big, fat," *ombo* "big, strong, thick," *-mpa·u* "big, thick," as augmentative suffix *-mba* (e. g. *a·χ-mba* "old, mature" of males, *gu-mba* "old, mature" of females), Sq. *umpa* "great," Ar. *umba* "fat." Cf. Ach. *äphau* "fat" (adj.); Chim. *-xu-* (from **-p'u-*) "fat" (adj.); Yan. *p'ui-* "to be fat"; Po. *pui* "greasy"; Sal. *upent* "fat" (n.). Hokan **up'awi* "fat, stout"?

86. full: *m-aχni·* (for *m*-prefix in adjectives see Morphology). Cf. E. Po. *minam* "to be full, fill"; Yan. *b-a'ni-* "to be full" (for *b*-prefix in adjectives see Morphology). Hokan **m-a'ni-*, **p-a'ni-*?

87. good: *m-i·χnᵛa* (with *m-* prefix as in no. 86). Cf. Ton. *hinox*; Cot. *k-ɛnas* (for *k*-prefix see Morphology); Was. *aŋau*, *t-aŋau*; (*-ŋ-* from *-χn-*?) Sal. *p-inxa* "good, successful (thing)" (for *p-* prefix see Morphology; *-nx-* from *-χn-*?); Moh. *ahɔ·-t* "good," *ta-ahana* "real, good," Yum. *axo-t* "good," Dieg. *ɔxan-n* "good" (Yuman **axana-t*?) Hokan **ihna-xw-*, **iχana-*?

88. green, blue: *m-a·ca* (with *m-* prefix as in no. 86), nominalized in *d-aca-lu·* "grass (sacate)," Sq. *maca* "green," Ar. *maca* "green"; Tlap. *matca* "green." Cf. Se. *ko-masso-l* "brown," *mosso-l*, *k-maso-l* "yellow"; Chim. *himamsu-t* "green, blue, yellow" (reduplicated from **-masu·*); Sal. *t'ə-mas* "grass" (nominalized from adjectival form **masa* instead of directly from radical **-asa* as in Sub.), perhaps also *ca·-* (from **asa'-*) in *ca·-xa'-*NE "blue." Hokan **asa-*, **asu-*, perhaps related to **aχwasi*, **aχᵘsi* "grass" (see no. 38)?

89. high: *m-i·si·ta* (with *m-* prefix as in no. 86). Cf. Sal. *-esu-*, *-usu-* in *k-usu-lulna'* "straight (tree)" (from "high-straight"? cf. *k-atu-lulna* "straight [road]"), plur. *k-esu-lu-ti-na*.

90. large: *d-a·gu* (with *d-* prefix, see no. 121). Cf. Chon. *kweka*; Se. *k-ako-ɬ* (for *-ɬ* cf. adjective forms in *-ɬ* in no. 88); Ton. *kwalo* "great"; At. *kome* "great"; perhaps also Sal. *k-a·xwen* "much." Hokan **aku*, **akwa*?

91. little: *tci·tci·* "little, younger brother," *r-i·tci* "little," diminutive *-tci* (e. g. *i·ya-tci* "water-little, brook"), Sq. *tcitci* "small, child," Ar. *tci-tci* "little." Cf. Chum. *tcitci* "child"; Po. *b-itcu*, *k-itci-du* "small"; as affixed element in Kar. *-itc* diminutive noun suffix; Po. *-ts*, *-tce*, *-tse-n* in relationship terms; Chum. *-itc-*, *-its-* (e. g. *ma-k-itc-tu'n* "my son," literally "the-my-little-son"); Yan. *-ɬs-gi*, *-ɬsɛ·-gi* diminutive plur. (also C. Yan. *'tcɛ-gi-* "to be small"); Was. *-tsi-* in *behɛ·-tsi-ŋ* "small."

92. old: *aχa*, *-aha*, *a·χ-* in *sɛku· aχa* "muchacho grande," *na-χka d-aha* "to grow" (literally "to go to maturity"), *a·χ-mba* "old" (for *-mba* see no. 85), *m-a·χ-* "more" (for *m-* see Morphology). Cf. Chim. *xawi-ni*, *hahawi-n-ta*" old"; Yan. *-a-* in *m-a'-tsk'i-* "feathers are old, worn out," *m-a'-tsk'i-lil-la* "buzzard" (for *m-*see Morphology); Chum. *χaχ* "large."

93. raw: *ma·ca* "raw (meat)" (there must be some phonetic difference between this word and *ma·ca* "blue, green," no. 88, perhaps of tone, for Lehmann accents "raw" as *ma·'ca'*, but "green" as *ma·ca'*; perhaps to be understood as *ma'ca*, cf. Yan. *-'su-i-*, Po. *tas*, *ɬasi-*, *kis*, and Sal. *malse-* below). Originally "red"? Cf. Chim. *masomas* (red.) "red salmon"; Sal. *malseko'*, *matseko* "chipmunk"; *n.* Yan. *-ra-psi·-*, *-ra-psu-i-* "red" <**-da-msu-i-* (probably incorporated form in *-i-* of old nominalized form **da-msu* or **d-amsu*); Com. (*pa-*)*mso-l* "red"; Cot. *msa-ɛ* "red." Hokan **masu* (**ma'su*?) contains adjectival *m-* (see no. 123). Primary **-a(')su-* "red, raw" is found also in Yan. *-'su-i-* "raw, unboiled, unripe" (incorporated element, with lost initial vowel, in *-i-* in verb forms); Chum. *uks-* (misheard as *u's-* from **a'su-*?) in *uks-tai* "red"; Was. *dal-coco-ŋi* "red" (*dal-* is color-adjective prefix; *-coco-* reduplicated from *-co-* from **-asu-*, with *u* umlauted to *o* by preceding *a*?). With *t-* prefix also in Chum. *t-asu-n*, *t-ase-n* "red"; Po. *t-'as* "red" (from **t-a'su*?). With *k-*prefix in Po. *k-'is* "red"; *k-'asi-l*, *k-asi-l*, *x-asi-l* "redwood."

94. ripe: *nɛgo*, *nɛɛzo* (this orthography points to *nɛ'go*; <**n'na-*?). Cf. Sal. *k-'nap*; Chim. *-m-ana-t* (read *-a'na-*?) "ripe" in *xo-manat* "unripe" (for *m-* see Morphology), but cf. *ho·mat* "ripe." Hokan **i'na-*?

95. sick: *-ndi·yu* in *na-ndi·yu*. Cf. Yan. *m-a'dɨ* "to be sick" (for *m-* see Morphology).

96. sour: *m-i·ka* (with *m-* prefix as in no. 86). Cf. Yan. *ɬai-* to be bitter; strong in taste"; Chim. *qoiyo-in* (read *ɬoyo-in?*) "sour." Hokan **ikay(a)*?

97. sweet: *m-i·ta·u* (with *m-* prefix as in no. 86). Cf. Po. *-itau, -itu* in S. Po. *kodi-bitau* "sweet" (for *b-* prefix see Morphology), S. W. Po. *tuitu* (reduplicated with loss of *i-*, originally **itu-itu*; cf., for similar parallelism of forms, N. Po. *tcado-l* "round": E. Po. reduplicated *tcodotcodo-k*).

98. white: *m-i·ca* (with *m-* prefix as in no. 86; cf. *t-i·tcu·* "white," *-g-i·ca* in *di-gi·ca* "white hair"), Sq. *mica*, Ar. *mica*; Tlap. *mitca*. Cf. Moh. *nya-masa-m*, S. Catalina *imica-pa*, Kiliwi *umesa-p*; Ton. *mas-lak*; Cot. *meso-i*; perhaps also Es. *matshai-ba* "white people." Hokan **m-isa*?

99. yellow: *moxmo* (red.) "yellow," *-mu·xi·* "to paint" in *na-mu·xi·*. Cf. Yan. *-mu'du-i-* "yellow" (incorporated element in *-i-*, cf. no. 93), probably derivative of *-mu'-*, *-mux-*; perhaps also Sal. *k-umtica* "brown."

H. Numerals

100. one: *i·mba, imba*, Sq. *imba*, Ar. *imba*, Br. *imba* (from **ipa*? cf. nos. 8, 85). Cf. Yan. *bai-*; Es. *pek*; Chum. *paka, pake-t*; Ton. *pax, paxaa-tak* "alone, only"; Chim. *po-la* "alone" (*-la* is diminutive). Hokan **ipa(ki)*?

101. two: *a·pu·*, Sq. *apu*, Ar. *apu*, Br. *apu*. Cf. Kar. *axak*; Sh. *xokwa*, Ach. *hak*, Ats. *hoki*; Chim. *xoku*; Yan. *u'-*, *ux-*; Po. *ako, ko, xotc, xos*; Moh. *havik*, Cocopa *howok*, Kiliwi *xuak*, Dieg. *xawok* (Hokan **-xwa-* becomes dissyllabic Yuman **xawa-*?); Sal. *xaki-c, kake-c, kak'-cu*; Se. *k-uxo-m, k-axku-m*; Chon. *oke*; Es. *xulax* (with inserted *-l-* indicating plurality-duality or distribution?); Was. *heske*; Ton. *ake-tai*; Coa. *ax-te·*. These forms go back to Hokan **axwa*, **axwaku* (**axwasku*?).

102. three: *a·su·*, Sq. *asu*, Ar. *asu*, Br. *assu*. Cf. Sh. *xatski*, Ach. *ɬcacdi*; Chim. *xodai*; Was. *helmi-ŋ* (with inserted *-l-*, cf. Es.); Po. *xom-ka, xoxa-t, kutc'a-ka*; Es. *xulep* (with inserted *-l-* as in no. 101); Moh. *hamo-k*; Se. *k-axpa-m*; Chon. *afa-n*; Sal. *kłapai, łapai(ł)*. These forms are all based on Hokan **axwa-* (cf. no. 101); for explanation of individual forms see note after no. 103.

103. four: *axku·*, Sq. *aku*, Ar. *axku*, Br. *asku*. Cf. Was. *hawa*; Es. *xama-x*; Chim. *qu·igu* (read *xu·i-gu*); Tonto *hoba*, Wal. *hoba*, Cochimi *hopa*, Yavapai *hopa*, S. Catalina *hopa*; Ach. *ha'-da·ma*; perhaps also Sal. *k'ica'* (from **xwaxwa'* or **k-(a)xwaxwa'*?). These forms too are based on Hokan **axwa-* (cf. nos. 101, 102); for explanation of individual forms see following note.

NOTE TO NOS. 101-103. It is remarkable how much the Hokan numbers for 2, 3, and 4 resemble each other. The following table shows the parallelism at once:

	2	3	4
Chim.....	*xok'u*	*xodai*	*xu·igu*
Sh.....	*xokwa*	*xalski*	
Ach.....	*hak*		*ha'da·ma*
Po.....	*ako, ko, xo-*	*xoma, xoxal*	
Es.....	*xulax*	*xulep*	*xamax-*
Moh.....	*havik*	*hamok*	*koba* (Wal.)
Sal.....	*kakec, kak'cu*	*klapai*	*k'ica'*
Was.....	*heske*	*helmi-ŋ*	*kawa*
Se.....	*-axku-*	*-axpa-*	
Chon.....	*oke*	*afan*	
Sub.....	*a·pu·*	*a·su·*	*axku·*

The resemblances are even closer than they appear to be; dialectic Pomo *ako, ko* (i. e. *ak'o, k'o*) goes back to *axo, xo*, Yuman *ho-* of *hoba, hopa* "four" is probably labialized from *ha-* because of following *-b-* (from *-w-* or *-xw-*, see below), and Washo *he-* and *ha-* are equivalent elements, *a* regularly changing to *e* when followed by *i* or *e*. There seems only one reasonable explanation for these curious parallelisms and that is to assume that they are due to etymological relationship. If "two" (Hokan **axwa*, less probably **uxa*) be taken as starting point, "three" will have to be explained as "two plus" or "two and one," "four" as "two and two." A close analysis seems to bear out this hypothesis. At the same time the various ways in which the idea of "three" may be derived from "two" would account for both the radical resemblance and the tantalizing differences in the derivative suffixes of the Hokan words for "three." "Two" and "four," as might be expected, show much greater conformity to Hokan prototypes. The following table attempts to group the forms on the basis of original structure.

2. (a) Radical element, Hokan **axwa*:
   - Yan. *u'-, ux-*
   - Po. *ako, ko*
   - Moh. *havi-k*, Cocopa *howo-k*, Kiliwi *xua-k*, Dieg. *xawo-k* (with adjectival *-k* as in Dieg. *miyul-k* "sweet"?)
   - Chon. *oke*

   (b) Hokan **axwa-ku*:
   - Kar. *axa-k*
   - Sh. *xo-kwa*, Ach. *ha-k*, Ats. *ho-ki*
   - Chim. *xo-k'u*
   - Sal. *xa-ki-c, ka-ke-c* (perhaps to be understood as *k-xaki-c*, Hokan **k-axwáku-*, cf. Seri)
   - Se. *k-ax-ku-m* (for intransitive *k-* and suffixed *-m* cf. Se. forms for "three")

   (c) With inserted plural *-l-* (cf. frequent use of infixed *-l-* in Sal.), **axwala-* or **axula-*:
   - Es. *xula-x*

   (d) With *-s-* suffix, **axwa-s-*:
   - Po. *xo-s, xo-tc*
   - Was. *he-s-ke*

(e) With other elements of less wide distribution:
Ton. *ake-tai*; Coa. *ax-te·*
Sub. *a·-pu·* (from **axwa-pa-k*?)

3. (a) Hokan **axwa-sa-* or **axwa-ɬsa-* (often with *-k-* suffix):
Sh. *xa-ts-ki*, Ach. *ɬca-c-di* (perhaps **χwa-ɬs-* shifted to **xwa-ɬs-*, whence, with sibilant development of *x*, *xw* characteristic of Shasta-Achomawi and with glottal metathesis, **ɬsa-ɬs-*, **ɬsa-s-*)
N. E. Po. *ku-tc'a-ka*, S. E. Po. *xo-xa-t* (from **χwa-sa-* or **χwa-s'a-*; Pomo *s*, *c* generally appears as *x* in S. E. Po., e. g. *xama-* "ear," but *cima* in other dialects)
Sub. *a·-su·* (from **axwa-sa-k*, see Phonology)
(b) With element **-ma-* "together with, added to" (see no. 114; cf. Yana numerals like *bai-ma-mi-* "six," literally "one-with [five]-aside"), **axwa-ma-* "two-plus":
E. Po. *xo-m-ka* (*-ka* as in *kulc'a-ka* "three")
Moh. *ha-mo-k* (*k-* as in *havi-k* "two")
(c) With suffixed **-pa*, perhaps identical with **ipa* "one" (see no. 100), **axwa-pa-* "two-one":
Se. *k-axpa-m*
Chon. *afa-n* (from **ax^{u}pa-*?)
(d) With plural *-l-* inserted in type b or c, **axwa-l-ma-*, **axula-pai-* (based on **axwa-pai-* "two-one"):
Es. *xule-p* umlauted from contracted form **xula-pi*?)
Sal. *kla-pai*, *lapai-* (from **χ^{u}la-pai-*; perhaps to be understood as *k-xla-pai*, Hokan **k-axuld-pai-*; note that Esselen and Salinan forms go back to identical prototype)
Was. *he-l-mi-ŋ* (from **axwa-l-mi-*)
(e) Hokan **axwa-ta-*:
Chim. *xo-dai* (cf. also Ach. *ɬca-c-di*?)

4. (a) Hokan **axwa-χwa* "two-two," generally disguised by secondary processes:
Was. *ha-wa* (dissimilated from **axwaxwa* to **axwawa*)
Ach. *ha-'-* in *ha'-da·ma* (from **axwax^{u}-*, **χwax^{u}-*)
Sub. *a'xku·* (from **a'χwagwa-k*<**a'χwawa-k*, cf. Washo; see Phonology; note Sub. *a·-* in "two" and "three" from **axwa'-*, but *a'χ-* in "four" from **a'χwa-*)
Yuman *hoba*, *hopa* (probably dissimilated from **axwa-χwa*, perhaps through **axwa-wa*, cf. Was. and Sub.)
Sal. *k'ica'* (from **axwa-xwa-*, dissimilated from **axwa-χwa-*, with Hokan *x'xw* shifted to *c*, as regularly, and *-a-* palatalized to *-i-* before *c*; perhaps to be undertood as *k-xica'*, Hokan **k-axwa-χwa-*)
(b) With element **-ma-* (cf. type b of "three"), **axwa-ma-* "two-together, set of twos":
Es. *xa-ma-x-*
(c) With dual **-u·*, **-u·-wi*, **axwa-ku·(-wi)* (see type b of "two"):
Chim. *xu·igu* (read *xu·kuw*^{t}?) (this formation would be entirely parallel to Yan. *lal-u·wi* "two feet"; Chum. *cku·m-u* "four, two twos," cf. *icko·m* "two")

I. Demonstrative, Interrogative and other Pronominal Stems

104. this: *-la* in *ka·-la*, *ẋa-la* "this one," *-la* "this" (e. g. *gwa-ya-la* "this house of yours"), Sq. *ka-la* "this," *endo-la* "this day, today." Cf. Chum. *al-*, *ala-* article (e. g. *al-apa* "sky," *ala-xüwüil* "coyote"); Es. *la-* of *la-l* "he"; perhaps Sal. *-la*, *-l-*, *-l* of *he-l*, *i-l·a*, *i-l-ta* "soon, afterwards"; probably Chon. *l-*, *ka-l*, *al-* noun prefix (e. g. *l-ahutl* "house," *ka-l-ora* "sun," *al-ʃo·na* "sun"). Here belongs also Sub. *-lu·* (see no. 122).

105. this, that: *ta-* demonstrative stem in Ar. *ta-ka* "celui-ci, celui," *ta-lu* "celui-là." Cf. Yan. *da*, *-da-i-*, *a-dai-*, *a-dai-ri* "that"; Po. *te·-* in *te·-ya* "those people"; Chum. *i-te*, *tu-yu* "this"; Se. *i-ta-m* "he, that"; Kar. *ta* adverbial particle preposed to verb forms indicating "probably indefinite or imperfect time"; Was. *da-*, *de-* "his," *d-i-* "him-I" (in verb forms), adverbial particle *da*, *-da* (e. g. *ic-da* "and then," *i-da* "thereupon"); Sal. demonstrative particle *-ta*, *ta-* (e. g. *i-l-ta* "soon," *na·-ta·*, *ta-na*, *ta-ha*, *ta·* "now"); Ton. *te-l*, *ta-ka*, *wa-ta-c* "that, this"; Coa. *ta* "that, the"; Karan. *ta-l* "that, he." Related to Hokan **ta* "that" is probably *t-*, nominalizing prefix (see no. 120).

106. that, he: *ka·-* in *ka·-la* "this one," *ka·-gi* "eso," *ka·-gi-nu* "esos," *-ka* (*-ŋga*) in *i-ka*, *i-ŋga* "he," Sq. *ka-* in *ka-la* "this," *ka-gi* "that"; perhaps also *ga-* verb prefix indicating futurity. Cf. Ton. *-ka* in *ta-ka* "that, this"; Chum. *ka-*, *qo-* in *ka-i*, *ka-ki* "this," *qo-lo* "that"; Chon. *ka-l-* noun prefix.

107. that (past): *di·-*, *di-* in *di·-ci·i* "yesterday" (literally, "that [past] day," cf. no. 33), Sq. *di-ci*, Ar. *di·-ci*. Cf. Was. *di·* "there (distant)," *di·-di* "that (distant)." Perhaps related to no. 105.

107a. this: *i-* general demonstrative stem of nearness: *i-ŋga*, *i-'ka* "he," *i-ku·* "I," *i-ka* "thou" (note that "I" and "thou" are based on general third personal *i-ka*, see no. 106, as Yan. *ai-'nidja* "I" and *ai-'numa* "thou" are based on *ai* "he, the"), *ɛ-nᵛu·* "they" (from **i-mak*, see Phonology; *-inᵛu·*, *-nᵛu·* used as personal plural), *i-ŋgi·* "near" (based on *i-ŋga* "he, it," perhaps from **i-ka-t* "this-at"), *nᵛa* "and" (from **i-má* "this-with," see Phonology), *ɛ-ndo* "today" <**i-nwa* "this-day" (see no. 31 and Phonology); perhaps also in *gi·-* "on, in, at" (see no. 113) which may be verbified *g-i·* "to be at (this)." Cf. Kar. *-i-pa* "this," *-i-kᵛu* "that" (see no. 108); Sal. *i-l·a*, *i-l-ta* "soon," *i·-n* "yet, still"; Chum. *i-te* "this," *i-two* "that"; Was. demonstrative stem *i-* in *i-c* "then," *i-da* "thereupon," *i-ŋa* "because, although" (originally "this-with," see no. 114); Se. *i-ta-m* "he, that"; perhaps also Yan. *-i* of *dj-i* "the" (used before first person singular and plural possessive forms; contrast *dj-u* for second personal forms).

107b. here: *nana*, Ar. *-nu, -na* of *aya-nu* "ici, par ici," *aya-na* "viens ici" (for *aya-* see no. 69); probably also verb prefix *na-* present tense (originally demonstrative adverb "now"?). Cf. Sal. *na, nona* "this, these," *na-ye, ło-na-i* "here," *na·-ła·* "now," *ła-na* "now," *no'*, *non, no·no'* "soon, some time, now"; Chum. *-na* in *kiɛ·-na* "this" (animate); Yan. *na-* "that it is" (see *Yan.*, no. 95). Perhaps related to absolutive **-na* of nouns (Kar. *-r, -ra*; Yan. *-na*; Es. *-no, -na-x, -ne-x*), see Morphology.

108. yonder: *ba·-* in *ba·-ri* "there, allá." Cf. Kar. *pa* demonstrative pronoun of reference, *pa-ipa* "this," *pa-ikᵘu* "that"; Chim. *pa·-mut, pa·-ut* "that"; E. Po. *ba* "that, the," *u-ba, me-ba* "that"; Sal. *pe* "that, the, those," *pa* "that, those," *pa* "there, here," *ne-pa, ne-pe* "there, here"; Yan. *bɛ·-* "(it is) so and so which, who."

109. what?: *ma·-* in *ma·-na* "what?", *mu·-, -mu·* (from **ma-k*? see Phonology) in *mu·-nạ* "what?", *nu-mu·* "where?", *-mbi·* in *a-mbi·* 'when?" (or *m*: *mb* see Phonology), *-mba* in *mi-mba* "how much?" Cf. E. Po. *am* "who? what?"; Yan. *'am-bi-* "who?"; Chim. *qo-ma-s* "who?" (*qo* is used as general interrogative stem); Sal. *ma-s* "somebody, someone"; Yuman *ma-* (e. g. Moh. *ma-ki* "where?", Dieg. *mai-ve* "where?").

110. where?: *a·la* "where? whence? whither?" Cf. Ton. *ala* "where?" Coa. *anu, ani*.

111. all, many: *ba·-, ba-* in *ba·-na* "all," *baa* "enough," *ba·-nᵘu* "many." Cf. Yan. *-ba-* suffix in verb forms "all, several," *-ba-nau-ma* "everybody."

112. my: *-u·* (after consonants), *-yu·* (after vowels), from **-a-k*, **-ya-k* (see Phonology), *i-ku·* "I" from **i-ka-k*; Tlap. *r-ulu·* "my mother" <**-ula-k* (cf. *r-ula-lo* "our mother"), *ano* "my father" <**ana-k* (cf. *ana-lo* "our father"). Sub. **-k* is also used as objective "me," e. g. *-lu· <*-la-k* imperative particle+"me" (see no. 126). Cf. Chon. *ka-, ki-* "I" (incorporated); Po. *ke* "my"; Sal. *k'e', he·'-k, ke-k* "I," *-ak* objective "me" in verb forms; Chum. *k-* "I; my"; Ton. *ka* "me."

J. Particles

113. at: *gi·-* "on, in, at" (e. g. *gi·-di·yalu·* "in the water"), *gi·-* "toward, from" (e. g. *gi·-nᵘaxu·* "from work"). This general locative particle is also compounded in *gi·-ka* "behind, back of," *gi·-ku* "upon, over." Cf. Yan. *gi* general locative and objective particle before nouns; Sal. *ke, k-* locative element before pronominal suffixes (*k-'e* "to me," *ke-o* "to him," *k-'a* "to us," *k-o* "to you pl.," *ke-wał* "to them").

114. with: *ma*, generally as postposition (e. g. *iku·-ma* "with me"), sometimes preposed, *ma·-ni* "with, by means of"; also *nᵛa* "and" (from **i-ma*, see no. 107a), plur. *-i-nu·*, *-i-nᵛu·*, *-nᵛu·* <**-i-ma-k* "being with this," *enᵛu·* "they" (from **iˇmak*). This element (*ma-*, *m-*) is frequently used as verbal prefix in subordinate clauses of purpose (e. g. *ma-nᵛa* "for drinking," literally "with-drink," *m-iu* "for eating"); also as indirective, locative, or connective suffix in verbs (e. g. *niˑ-cna-ma* "gave," *naˑ-data-ma* "we speak," *iku· na-daˑtcoˑ-ma ika* "I listen to you," *na-dia-ma d-aˑguˑ-luˑ* "to put with fire, to burn," *na-cka-ma* "to reach," *iku· na-tcaˑ-ma* "I come," *na-stox-ma* "to bind"). Cf. Yan. *-ma-* verb suffix "together with," *-ma-*, *-m-* indirective "to" (with first and second person object and in passive forms), *-m-isi-*, *-mi-isi-*, "with one another"; Chim. *-m-* in *-m-di*, *m-du* instrumental postposition; Kar. *-mu-k* nominal postposition "with"; Po. *-ma* verb suffix expressing plurality of subject, *-ma* "each other," *-ma-k* nominal postposition "in company with," *-mak* verb suffix "to be provided with"; Es. *-ma-nu* "together with" (cf. *-nu* "by means of"); Was. *-ŋa-* in *-ŋa-wa* "more, besides," also *-ŋa*, *i-ŋa* "because, although," *ic-ŋa* "but"; verbalized in Sal. *k-amau* "to be together, join." Hokan indirective **-m(a)* seems to be found also in Po. *dika-m*, *daka-m* "to give": *diaxa*, *diˑka*, *diˑkau*; Sal. *omia-m* "to meet," *p-aye-m* "to carry" (no. 58a).

115. in: *wanᵛ*, *waŋ-* "in, inside, into" (e. g. *waŋ-gwaˑ-yuˑ* "in-house-my"), *na-waŋ-no* "stomach." Cf. Yan. *-wul-* "into" (as verb suffix), *i-wuˑlu* "inside"; Kar. *-furu-k* "into the house" (verb suffix); Ach. *-lu* "into the house" (verb suffix; from **-xlu*?); Chim. *-xun* "into" (verb suffix), absolute *xuno-i* "into." Hokan **xwulu* from **xwalu* (**x-walu*)? Cf. also Penutian **wani*: Takelma *-wini-* in *haˑ-wini-deˑ* "in-interior-my, inside of me"; Wishram (Chinookan) *-wan* "belly, womb"; Tsimshian *wun-*, Nass River *hwn-* "innermost part."

116. a little: *ax-* in *ax-kwiˑ* "a little" (from **axu-*?), *-xo*, *-xuˑ* in *gwa-xo*, *waˑ-xuˑ* "a little, something." See also no. 54? Cf. Chim. *-gu*, *-ku* "somewhat, a little" (e. g. *xaniˑ-gu* "by and by," *patce-am-ku* "something"), *-gu-la-n* "merely, only"; Yan. *-gu-* verb suffix "a little, just." This element (**axu-*, **-ku*) is probably closely connected with:

117. not: *aˑ-* (from **axwá*, see Phonology) as prefixed element, also as enclitic *a* (e. g. *suˑluˑ aˑ* "someone not, nobody"). Cf. Hokan **kˑu*, **ku* (also **xu*?): Yan. *kˑu-* "to be not," *kˑu* "not"; Chim. *xu-* "not," *x-* negative verbal prefix, *-gu-*, *-ku* negative suffix (e. g. *patci-gu-n* "no," *amaidatci-ku* nowhere"), *-c-ku-t*, *-c-ku-n* "without"; Po. *ku-yi*, *ku-i*

"no, not"; Sal. *ko-*, *k-* negative prefix; Coa. *ox*, *oxua* "not"; Karan. *ko-m*, *kwoo-m* "no, not." Presumably Hokan **(a)xu-*, **(a)k'u* of nos. 116 and 117 was proper to accented forms, **-ku* (with intermediate *k-g*) to unaccented or enclitic forms.

118. now, already: *ci·* (e. g. *ci·-naa* "now," *ci· waxi·* "it is late already"), also *ci·-*, *ci·-ni-* "already" as perfective prefix. Cf. Po. *co* "now"; Ton. *huc*; Karan. *aca-hak*; possibly also Yan. *-si* present indicative verb suffix (originally "now"? This etymology is by no means as far-fetched as it seems, as there can be little doubt that Yana tense-modal suffixes are nothing but petrified stems which were originally independent, e. g. quotative *-t'i:* verb stem *t'i·-* "to say").

119. past time: *ni-*, used as verb prefix or, better, proclitic particle to express past time. Cf. Yan. *-'ni-* preterit verb suffix (*-'-* probably shows that *-ni-* was originally felt as enclitic particle disconnected from verb form proper; cf. *-'ni-dja* "I," *-'nu-ma* "thou" for original *-ni-dja*, cf. *-n-dja* "I," and *-nu-ma*); Po. *-ne*, *-ni* apparentative verb suffix ("must have"). Hokan **ni* probably old particle verb: "it was, it happened."

K. Grammatical Elements[8]

120. Sub. d- absolutive noun prefix of frequent use (see Morphology). This element is probably petrified from demonstrative **ta-* (see no. 105), but it is possible that it already occurred as nominal prefix (**t-*) in early Hokan and did not merely develop independently in several dialects. Cf. Sal. *t-*, *ṭ-* article prefix of many nouns, also frequently used to nominalize verbs into subordinate clauses; Chum. (San Luis Obispo dialect) *t-* article prefix of many nouns (e. g. *t-axa* "bow": *ax* of other dialects), but probably also as survival in other dialects (e. g. *t-em*" leg, foot": Chon. *imits*; Moh. *ime*; Com. *emi*); Was. *d-* common nominal prefix (e. g. *d-aŋa-l* "house": *aŋal* "to dwell"), probably also in *d-i·-* "my" (cf. Sal. *ṭ-m-* "thy," Sub. *d- . . . -u·* "my"); Sh. *t-*, *d-* perhaps in certain survivals (see no. 24), further Ach. *d-* in *d-isoq* "urine" (: Sh.

[8] There is, of course, no real line of division between grammatical elements and proclitic or enclitic particles. I have here listed such elements as seem more definitely grammatical in character. Some of them, like intransitive *g-* and adjectival *m-*, evidently belong to a far older stratum of the language than such proclitic particles as *ni-* (no. 119), *ci·-* (no. 118), or *na-* (no. 107 b).

icukwi, Ats. *wissuq*; Was. *d-a·ca* "urine," *aca* "to urinate"; Chum. *oxco-l* "urine"); Po. *d-* apparently in certain nouns (e. g. *d-ano*, *d-ono* "mountain": S. E. *k-ano*, *k-no*, see no. 41; *d-axo*, *d-ako*, *d-aγo-n*, *d-oko*, *d-uku-l*, *t-uku-n* "pestle": S. E. *s-ku-n*; *d-iwe*, *d-uwe* "night": *i'we*, *iwe*; *d-apo* "fog": *pot*; *d-iwi*, *d-owi*, *d-uwi* "coyote": *i'wi*). For Hokan noun prefixes, see Morphology.

120a. Sub. *r-*, *ɾ-* absolutive noun prefix (see Morphology); Tlap. *r-* in *r-utu·* "my mother" (properly "the-mother-my"). Cf. Sal. *l-* absolutive noun prefix; Chum. *a-l-*; Chon. *l-*, *t-l-*, *ka-l-*, *ha-l-*. See also nos. 104, 122. For adjectival *r-* in Sub. see Morphology.

120b. Sub. *s-*, *c-* absolutive noun prefix (see Morphology). Cf. Sal. *s-*, *c-* absolutive noun prefix; Chum. *s-*, *tc-*; Yuman *s-*. See also no. 123a.

120c. Sub. *p-* absolutive noun prefix (see Morphology). Cf. Sal. *p-* absolutive noun prefix; Po. *b-*.

120d. Sub. *k-* absolutive noun prefix (see Morphology). Cf. Po. *k-* absolutive noun prefix; Sal. *k-*; Yuman *k-*.

121. Sub. *d-* adjectival prefix (e. g. *d-a·gu* "big"), perhaps identical with no. 120. Cf. Was. *t-*, *d-* (e. g. *t-aŋau*, *d-aŋau* "good": *aŋau* "to be good"); Yan. *da-* in adjective verbs; Po. *d-*, *t-* (e. g. N. E. *t-uya* "small": S. *-uya* in *baiya-uya* "man-small, boy"); Sal. *t-*, *ʈ-* (e. g. *t-elwa-ne* "strong, fierce": *lu·wa'* "male, man"; *ʈ'-xauwat* "yellow": *s-xauwit'* "acorn"); Chum. *t-* (e. g. *t-asu-n* "red," see no. 93). This element is discussed below.

122. Sub. *-lu·* common noun suffix (e. g. *d-i·ya-lu·* "water": *i·ya* "water," *i·la-lu·* "island" borrowed from Spanish *isla*), probably related to demonstrative *-la* (see no. 104; *-lu·* perhaps from **-la-k*, see Phonology); Tlap. *-lo* (*e.g. r-uta-lo* "thy mother": Sub. *d-u·ta-lu·*). Cf. Chim. *-r*, *-l* noun suffix (e. g. *tcima-r* "man," *piso-l* "quail"), *-ra*, *-la* (e. g. *pxici-ra* "skunk"; diminutive *-l-la* is dim. *-l-*+absolutive *-la*); Po. *-l* absolute noun suffix (e. g. *fo-l*, *po-l* "beads": *fo*, *po*; *cala-l* "liver": *cala*; *mitci-l* "day": *matci*; *yu-l*, *hu-l* "snow": *yu*, *i'yu*; *k-asi-l*, *k-'asi-l*, *x-asi-l* "redwood": *k-'is*, *t-'as* "red," see no. 93; *buraka-l*, *beteka-l* "bear": *butaka*), also *-n* (e. g. *kasi-n* "redwood," *tuku-n* "pestle": *duku-l*, *dako*); Dieg. *-lᵛ*, *-ll* (e. g. *'emi-lᵛ* "leg, foot": Moh. *'ime*; *apa-ll* "arrow": Moh. *ipa*); Was. *-l* (e. g. *d-aŋa-l* "house," *ts-iga-l* "kidney," *ts-ime-l* "beard"); Es. *-l* (in *la-l* "he," *make-l* "rat," *kumu-l* "quail," *halaka-l* "mussels," *kalu-l* "fish": Yan. *gala·*, *kume-l* "knife"), *-la* (e. g. *imi-la* "sea," *maksa-la* "earth": *matra*); Ton. *-l* in *te-l* "that, this"; Karan. *-l* in *ta-l* "that, he."

123. Sub. *m-* adjective prefix (e. g. *m-a·ca* "blue, green": *d-aca-lu.* "grass"). Cf. Yan. *m-* (e. g. *m-a·si-* "to be ripe": in-

corporated *-si-*); Po. *m-* (e. g. *m-ato* "large": *b-ate*); Yuman *m-* (e. g. Dieg. *m-iyul-k* "sweet": Sal. *k-esiyu-'k* "sweet"); Sal. *m-* (e. g. *m-aʃ'al* "white"). This archaic element is discussed below.

123a. Sub. *s-*, *c-* adjective prefix (see Morphology). Cf. Sal. *s-* adjective prefix. This element is probably identical with no. 120b.

124. Sub. *g-* intransitive verb prefix (e. g. *-g-i·ma* "to ascend": *d-ehma-lu* "sky"). Cf. Sal. *k-* prefix for static verbs and adjectives (e. g. *k-axk'o'* "to be careful," *k-alep* "to forget," *k-itcmila* "transparent"), alternating with active *p-*; Se. *k-* adjective and numeral prefix (e. g. *k-opol* "black," *k-akol* "great," *k-uxo-m* "two"); Po. *k-* prefix for intransitive verbs and adjectives (e. g. *k-amale* "angry," *k-itci-du* "small": *b-itcu*); Chum. *k-* (e. g. *k-opo-k* "dead": Chim. *-po-* "to sleep"); Ton. *k-* (e. g. *k-opol* "round": *pilil* "round"); Cot. *k-* (e. g. *k-enas* "good": Ton. *hinax*, see no. 87). This important and evidently archaic Hokan element is discussed below.

125. Sub. *d-* transitive verb prefix (e. g. *-d-ia-ma* "to make go with, to place"). Cf. Was. *d-* (e. g. *d-amal* "to hear," originally "to make, give ear," see no. 7). This element is discussed at greater length below.

126. Sub. *-la*, *-l* imperative particle, *-lu·* < **-la-k* imperative with first person singular object (e. g. *da-cna-lu·*, *da-cna-l iku·*, *da-cnu·-la* "give me!") Cf. Es. *-la* imperative particle (e. g. *es-la hasa-na*[*x*] "bring water!" *iuk-la asa-nax* "give me water!" *absku-la* "look!")

II. NOTES ON SUBTIABA PHONOLOGY

It is not my purpose to discuss Subtiaba phonetics in any detail, nor would Dr. Lehmann's somewhat inadequate orthography make it possible to do so in any event. A few indications of probable or possible phonetic developments should be of some service, however, in elucidating the lexical comparisons that I have suggested. The phonetic character of Subtiaba seems not dissimilar in some respects to that of Mixtec-Zapotec-Otomi (cf. such syllables as *mba* and *nᵛaų*) and it would not be at all surprising if this Hokan language, the neighbor of languages of the Mixtec-Zapotec-Otomi group both in Mexico and in Nicaragua (Mixtec, Trique, Mazatec, Mangue-Chorotega), had been somewhat influenced by them in its sound system.

Vocalic Changes. There is evidence to indicate that *a* is umlauted

in many cases to ɛ (or *e*) by following or originally preceding *i*. Examples of *a* umlauted to ɛ by following *i* are:

ɛɛdi, *ɛ'di* "blood" <**a·'ti* <**axwa'ti* (no. 3)
ɛmbi "owl" <**ambi* (no. 64)

Examples of *a* umlauted to ɛ by an unaccented preceding *i* which has disappeared (see below) are:

me- "camisa" <**ima-*? (no. 52)
sɛ-ku· "child" <**isa-k'u* (no. 54)
sɛ-ka "sister" <**isa* (no. 56)
nɛ-go, *nɛɛ-go* "ripe" <**i'na* (no. 94)
mɛ-nu· "nine" <**imba-nak* "one-missing"? (cf. no. 100); that *mɛ-* is derived from *imba-* and not from **ima* seems to be indicated by *nᵛa* from **ima* (see below)

In another series of examples original *i* has been modified to ɛ (or *e*) by a following *a*, either preserved, lost or itself contracted with following *-k* to *-u·* (see below):

ɛtcu· "head" <**is(a)nu*? (no. 14)
ɛnᵛu· "woodpecker" <**inak* (no. 29)
eme "camisa" <**ima*? (no. 52)
d-ehma "en haut" <**i'ma* (no. 44)
ɛnᵛu· "they" <**imak* (no. 107a; see also no. 114)
ɛndo "today" <**i-nwa* (no. 31)

In *me-*, *eme* "camisa" from **ima* (see No. 52) both vowels appear to have modified each other; but it is rather probable that **ami* (or **imi*) should be assumed for Sub., as **ima* would have resulted in *nᵛa* (see below). In *ɛńᵛu·* "they" and plural suffix *-(i)nᵛu·* we appear to have a doublet (*ɛ́-*: *-i-*) dependent on differences of stress. It seems likely that all examples of Sub. ɛ go back to *i*-umlaut of *a* or *a*-umlaut of *i*.

Somewhat analogously, *a* seems to have become rounded to open *o* or to *ω* (Lehmann's *å*) by following *w* in:

goo "his house" (from **gwoo* <**gwa-wa*? cf. *gwa* "house")
ω·s'nko· "lizard" <**aswa-'n-ka-* (no. 27)

Postconsonantal *wa* also became *o*:

ɛndo "today" <**i-nwa* (no. 31)

Here belongs apparently also *kwa* > *ku·* :

kų·i "to come" <**k'wani*, **k'wali* (no. 63)

Monophthongization of Diphthongs. The diphthong *au* seems to have often become monophthongized to *u·* or *o* and we find variants of *au:u·*, *o*. Examples are:

-mpa·u "big, fat": *ombo* (based on *umba*, *-mba*); see no. 85
mi·na·ˊu "alone": *miˊno*

As the last example shows, the difference between diphthong and simple vowel is probably due to differences of stress. These examples help to explain a series of alternating forms in *-a* and *-o* (or *-u·*), in which a suffix *-w* or *-u* seems to have combined with the final *-a* of the stem:

-d-apa: *-g-apo*, *-g-apu·* "to sleep" (no. 80)
na-cka-ma "to reach": *iku· ni-cka-mo* "seized me"
na-dia-ma "to place at": *na-χka ga-dia-mo aku·* "to go to make fire"
iku· na-cna "I give (you)": *iku· na-cno* "I give him"
na-data, *na·-ata* "to say": *ika iku· na-to* "you say to me"

We are therefore prepared to find examples of Sub. *-u·* < Hokan *-au*:

d-asu· "fat" < **axau* (no. 11)
-gu· "to sleep" < **kau* (no. 81)

For *-u·* from *-au* < *-ak*, see below.

Parallel to *au* > *u·*, *o* is *ai* > *i·*. An example from Subtiaba itself is:

yi·tu "tear" < **ya-i'tu* (no. 9)

Final *-i·*, *-i* probably goes back to Hokan *-ai* in:

i·ci "tree" < **ixai* (no. 47)
d-ici·-lu· "bow" < **ixai* (no. 49)

For *-i·* from *-ai* < *-at*, see below.

Change of w *to* gw. There is clear evidence in Subtiaba of an interchange between initial or intervocalic *w* and *gw* and of *ŋw* and *ŋgw*. As final *-w* unites with preceding *a* to form *-au* or *-o*, we may have an interchange between final *-au* (or-*o*) and medial *-agw-* (*-akw-*). Examples are:

aŋwa "mountain": *aŋgwa* (no. 41)
d-a·wa "there is not": *d-a·gwa* (no. 70a)
na-ga·wi· "to flee," *na-ga·u* "to go": *na-ga·gwi·* (no. 70)
a·-na-wano "you are not silent": *na-gwano* "quedarse callado"
waχu·: *gwaχo* "a little"

waxi· "late": *gwaxi· dimba si·gu·* "one year late"
d-a·ų, d-q·ų· "mouth" (<*d-qw, d-aŋw*): *d-aŋgwa* (no. 16); cf. also *na-ŋgwa-xa* "to yawn"
yu·a "cabuya" (read *yuwa*): Tlap. *yugua* "maguey" (read *yugwa*)
-ło "to say" (from *-ła-w*, see above): *ni·-łakw i·ku·* "I said," *ni·-łakw i·ka* "you said" (from *-ław i·-*)

The last example and such cognates as *aŋwa* "mountain": Chim. *awu* (*a·ma*), *d-a·wa* "there is not": Sal. *k-awa* "to be lacking," *-g-a·u* "to go": Hokan **awa*, and *d-a·ų* (*d-aŋgwa*) "mouth": Chim. *h-awa* suggest strongly that *w* is the original consonant and that *g* arose parasitically before it. In the following examples original *w* appears regularly as *gw* (*g*, *k* before *-u·*):

gwa "house" <Hokan **(i)wa*, **(a)wa* (no. 50); but Ar. writes also *iwā*
a·gu· "fire" <*agwu·* <**agwa-k* (see below) <Hokan **'awa-* (no. 36)
axku· "four" <*ax"gwu·* <**axwagwa-k* (see below) <**axwawa-k* (no. 103)

Vocalization of Final -ak *and* -at. Subtiaba seems to tolerate no final consonants. As unaccented vowels frequently disappeared (see below), this can only mean that the final consonant which remained when an originally following unaccented vowel was lost united to form a diphthong or long vowel with the preceding vowel. There is not enough evidence available to work out all the phonetic developments that must have taken place, but it is rather clear that *-ak* became *-u·* (*or -o·*) no doubt via *-au*. We may gather this from comparative evidence, from alternations within Subtiaba of forms in *-a* and *-u·* (i. e. *-a-*+a lost consonant), and from at least one luckily preserved alternation of *-u·* : *-ag-*. Examples are:

i·su· "bone" <**ixak*, **ihyak* (no. 4)
ɛn"u· "woodpecker" <**inak* (no. 29)
ω·s'nko· "lizard" <**aswa'nkak* (no. 27)
m-i·du·u· (read *mi·du·"?*) "night" <**itako* (no. 42); cf. Coah. *tako·-m* "night" and Sub. (Sq.) *m-idagi-na* "black"
t-i·tcu· "white" <**t-i·ca-k* (no. 98); cf. Sub. *m-i·ca* "white"
mu·-, -mu· "what?" <**ma-k*; cf. Sub. *ma·-* (no. 109)
-ga-n"u· "to die" <**-g-imak* or **-g-imax(w)* (no. 65)
ra·bu "person, man" <**ra·ba-k* (no. 54a): *ra·ba-gu·* "woman," literally "person-female"
-lu· "the" <**-la-k* (no. 122); cf. Sub. demonstrative stem *-la* "this"

-lu· imperative particle + "me" < **-la-k* (no. 126): Es. *-la* imperative particle; Sub. *-la*, *-l*
a·gu· "fire" < **'awa-k* (no. 36)
uku· "moon" < **axawa-k?* (no. 40)
ɛ-nᵛu· "they," plur. suffix *-(i)-nᵛu·* < **i-ma-k* (no. 114); cf. Po. *-ma-k* "in company with"
-u· "my," Tlap. *-o* < **-a-k(i)* (no. 112)
-u· numeral ending in *a·pu·* "two" (no. 101), *a·su·* "three" (no. 102), *axku·* "four" (no. 104), *wi·su·* "five," *ma·xu·* "six," *kinu·* "seven," and *mɛnu·* "nine" < **-a-k*; cf. Yuman numerals of type Moh. *havi-k* "two," *hamo-k* "three"

The group *-alk* appears as *-aų*, in other words the *-l-* became *n* and was absorbed as nasalization in *-au* < *-ak*:

nᵛaų "ear" < **ismalk* (no. 7)

It is reasonable to suppose that original *-at* was similarly vocalized to *-ai*, *-i·*. Several examples seem to support this view:

i·xki· "olosica" < **ixkat* (no. 26); cf. Sal. *i-l-kat* "ant"
ambi· "when?" < **a-ma-t* "what-at?" (no. 109)
iŋgi· "near" < **i-ŋga-t* "this-at"? (see no. 107a)
ga-mi·, *ga·-mi* "with, together" < **ga-ma-t* "that-together-at"? (see no. 114); cf. Sub. *ma* "with")

Palatalizing of Nasals. One of the characteristic features of Subtiaba phonetics is the frequency of the anterior palatal nasal, *nᵛ* (Lehmann's *ñ*). It is highly probable that this sound originates often and perhaps always, from *i*+ following nasal (*n*, *m*); *im* first became palatalized to *imᵛ*, which then fell together with *inᵛ* from original *in*. Before *a* unaccented *inᵛ* seems regularly to have simplified to *nᵛ*, which may therefore be considered as nasal (*n*, *m*) with inherent *i*-vowel. Before *u*, however, *inᵛ* sometimes assimilates to *unᵛ*. Examples are:

ɛnᵛu· "woodpecker" < **inak* (no. 29)
nᵛa·u· "hand" < **inaw-* (no. 13)
nᵛa "and" < **i-ma* "this-with" (no. 114); cf. Was. *i-ŋa* "because, although"
-nᵛa "to drink" < **ima* (no. 66)
-(i-)nᵛu·, *-i-nu·* plural suffix < **i-ma'-k* (nos. 107a, 114)
ɛnᵛu· "they" < **i'-ma-k* (nos. 107a, 114).
-ga-nᵛu· "to die" < **imak* (no. 65)
nᵛaų "ear" < **imalk* < **ismalk* (no. 7); *ism-* either assimilated to *imm-* > *inᵛ-* (cf. Was. *d-amal* "to hear" [read *-ammal?*] < **-asmalk*) or else *ism-* first passed to *isn-* > *inm-* > *(i)nᵛ-* (cf. Sal. *p-esna-*, *p-esno-* "to hear, listen"; Ach. *issal* and Sh. *isak* [read *issak?*] also presuppose **isnak* < **ismak*, cf. Ats. *asmak*)

un^{v}u· "worm" <**imu-* (no. 25)
u·nyu "string" (read *unn^{v}u?*) <**ip(a)mu* (no. 53)

An original **umu* "face" (itself probably assimilated from **uma*) seems to have dissimilated its labials to *inu* (no. 10); note that this *in-*, in contrast to *un^{v}u·* "worm" <**imu-*, does not palatalize to *(i)n^{v}u* or *un^{v}u*.

Change of l *to* n. There is some indication that an original *l* sometimes passed to *n*, whence nasalization of the preceding vowel:

n^{v}aɣ "ear" <**ismalk* via **ismank* (no. 7); cf. Yahi *mangu*: N. Yana *mal'gu*, C. Yana *malgu* (<**isma'-l'-ka-w*, old dual in *-w* from still older dual-plural form in *-l'-*)
ɛndo "day" <**i-nwa* <**i-lwa* (no. 31); but original **anwa* may be assumed as well as **alwa* for "sun"
-kų·i "to come" <**k'wali* (no. 63)

Possibly also:

wan^{v}, *waŋ-* "in" <**wali* (cf. Hokan **ɣ-wulu*, no. 115),

but this form is better referred to Penutian **wani* "inside."

Nasalized Stops. The consonant groups *mb* (also *mp*), *nd*, and *ŋg* are evidently equivalent to single consonants, at least psychologically. They are derived in certain cases from simple stops, probably by contraction with an old syllable which contained a nasal, but perhaps also by the direct change of intervocalic *-g-*, *-d-*, and *-b-* to *-g-*, *-nd-*, and *-mb-*:

bii· "day": *niɣka-mbi·i-lu·* "the whole day," *a·su-mbi·i·* "in 3 days"
ba·-n^{v}u "many": *pu·ru· mba·-n^{v}u* "somos muchos"
gi·ko, *gika* "liver": *ga-ŋgi·ga*, *na-ŋgiko* "fever (with liver affection)"
i-'ka "he" (for demonstrative stem *ka* see no. 106): *i-ŋga* "he"
na-goo "to filter, squeeze out": *c-iŋgoo* "wooden churn"

The comparative evidence suggests that under as yet undetermined conditions intervocalic *p* (and *p'*) became *mb*, *mp*; for the change of *-l-* to *-nd-* the evidence is more slender.

amba "excrement" <**ap'a* (no. 8)
umba, *-mpa·u* "fat" <**up'a-* (no. 85) or, more probably, **(u)m-up'a-* (see below)
imba "one" <**ipa* (no. 100)
-ndi·yu "sick": Yan. *m-a·di-* (no. 95) (but see below)

The *-mb-* resulting from *-p-* could become reduced, it seems, to simple *m-* in an unaccented syllable:

mɛ-nu·' "nine" (="one missing"?)<*imba-* "one" (with *a* umlauted to *ɛ* by formerly preceding *i* but with *m* not palatalized to *nᵛ*; *imba-* to *mɛ-*, but original **ima* to *nᵛa*)

On the other hand, it seems equally clear that under certain circumstances intervocalic *m* and *n* become semi-stopped to *mb* and *nd* (cf. *w*>*gw*):

ambi· "when?"<**ama-t*, also *-mba* in *mi-mba* "how much?": *ma·-na* "what?" (no. 109)
u·mba, *-umba·-* "earth"<**uma* (no. 34)
-mbi·ya "to cry"<**-mi·-*, *ɛmbi* "owl"<**ami* (no. 64)
ɛndo "day"<**i-nwa*
-ndiɛgu· "to laugh": Sal. *ilik* (no. 71) (but see below)

It is not possible to tell with our scanty materials when *m* and *n* remained and when they shifted to *mb* and *nd*. In the case of *ɛndo* the *d* may have developed as a glide between *n* and *w* of **i-nwa*. In *u·mba* too it is possible that the original form was **amwa* rather than **ama* (or **uma*). This would explain why some of the Hokan languages presuppose a type **ama* (Chimariko, Pomo, Yuman, Seri, Chontal), others rather **uma* (Salinan, Subtiaba). If we look beyond Hokan proper to other languages of the larger Hokan-Siouan group,[9] we find confirmatory evidence for an original **amwa* or **uma* (**oma*) in Yuki *on* (<**cm*<**oma*), Wappo *oma* "earth, world"; but Sioux has *ma-*.

It may not be without significance that Chipanec, which is closely related to Mazatec and Chorotega-Mangue, has analogous changes of *k*, *p*, and *t* to *ŋg*, *mb*, and *nd*, e. g. *kope* "to see": fut. *ta-ŋgope*, *pomo* "to think": fut. *ta-mbomo*, *tiri* "mountain": plur. *ni-ndiri*. It is quite likely that the general phonetic slant of Subtiaba was determined to a considerable extent by influences of languages of the Mixtec-Zapotec-Otomi group.

Hokan x *and* x̣. There seem to have been two distinct *k*-fricatives in Hokan, a more forward guttural (*x*) and a velar (*x̣*, also labialized *x̣w*). The latter sound is preserved in all dialects as *x* (*x̣*, *x̣*), as aspiration (*h*, '), or as aspirated stop (*k'*); good test words are **ax̣wa-* "two," **ax̣wa-*(*x̣*)*wa* "four" (see nos. 101, 103), **ax̣wa'li* "blood" (see no. 3), and **ix̣ana-* "good" (see no. 87). The more forward *x* is treated like *x̣* in certain dialects (e. g.

[9] See *Science*, N. S., Oct. 28, 1921, p. 408.

Chimariko, Yana, Pomo, Chumash, Tonkawa), but becomes assibilated to *s*, *c* (*cx*), or *ts* in others (e. g. Karok, Shasta-Achomawi, Esselen, Salinan); good test words are **ixa'* "stone" (see no. 45), **xaka* "flint, knife," and **axa* "water." Such examples as Sub. *axa*, *-aha*, *a·x-* "old" (no. 92), *-i·xnᵛa* "good" (no. 87), and *axku·* "four" (no. 103) doubtless contain Hokan *x* and *xw*; *x* is regularly palatalized to *x* after *i*-vowels. Another set of examples indicates that Hokan *x* was assibilated in Subtiaba to *s*, *c*:

isi·, *si·-* "stone" <**ixa'* (no. 45)
d-asu· "fat" <**axau* (no. 11)
i·ci "tree" <**ixai* (no. 47)
d-i·ci·-lu· "bow" <**ixai* (no. 49)

This assibilation in Subtiaba of *x* to *s*, *c* is important because it shows that the parallel process in Karok-Shastan and in Esselen-Salinan is rooted in an old Hokan distinction between *x* and *x*. That the assibilation took place independently in the three areas is demonstrated by the fact that Chimariko, which is rather closely related to Karok and Shasta-Achomawi but which tends to be more archaic than they, has preserved *x* distinct from the true sibilants. It is very likely that a more careful phonetic study than has yet been published of certain Hokan languages would indicate that Hokan *x* and *x* are still preserved intact. In Yana this is not the case, for they have fallen into a single sound, *x* or *h* (e. g. *xa-*, *ha-* "water" <**axa* like *ux-*, *u'-* "two" <**axwa-*). One wonders, for instance, whether the Yuman dialects do not distinguish *x* (or *h*) from *x* (or *h*). In the Subtiaba examples just given note that *s* remains in "stone" and "fat" because followed by original back vowels but appears palatalized to *c* in "tree" and "bow" because followed by *i·*, *i* from older *ai*. The treatment of Hokan *x* and *x* in Subtiaba may therefore be indicated as follows:

	before back vowels	*before front vowels*
Hokan *x* > Sub.	*s*	*c*
Hokan *x* > Sub.	*x*, *h*	*x*

A secondary Hokan *x* arose from *x* (*h*) before *y;* this was shifted to *s*:

i·su· "bone" <**ihyak*, **ixyak* (no. 4)

Observe that neither in *i·su·* "bone" nor in *isi·* "stone" has the preceding *i* the power to palatalize *s* to *c*. This is because the *s* is not a true sibilant in origin but is secondarily developed from *-xy-* and *-x-*. Contrast forms like *mi·ca* "white" with primary *-s-* (see no. 98).

Of much later date than the passage of Hokan *x* to Sub. *s*, *c* is that of Sub. *x* to *s* when immediately followed by a consonant. This change has not been consummated yet, for we find many alternative forms.

maxma "quick": *masma*
na-xka "to go": Ar. *na-ska*
na-xto "to shave, bark": *osto* "bark"
daxka "it stinks": *-da·ska* "to smell"
na-goxta·-lu· "volverse": *ni-gu·sta-ma* "te pareces"
nu·xmba "mulatto": *nu·smba*
axku· "four": Ar. *asku*
roax-nᵛu· "family": *daka-ruas nᵛu·nana* "gente de lejos"

The last example (cf. *ro·axi* "people") and the etymology of *axku·* (see no. 103) show that *x* is the older sound in these consonant groups and that they have originated by the dropping out of unaccented vowels that originally stood between the *x* and the following consonant. A somewhat similar process, but in the opposite sense, has taken place in Yana. Yahi *-x-*+consonant and *-s-*+consonant fell together into *-x-* (whence *-ʻ-*)+consonant in Northern and Central Yana.

Loss and Contraction of Vowels. We have already seen reason to believe that final vowels, presumably only if short and unaccented, are lost in Subtiaba, also that medial short vowels, if preceded by the accent, drop out and thus cause consonant clusters to arise. A few further examples are:

-g-iu "to eat" <**-g-iwa* (no. 67)
-t-a·u "to sit" <**-t-a·wa* (no. 77)
a·ˊx-mba "old": *axaˊ* "grown up," *d-ahaˊ* "maturity" (no. 92)
ax-(kwi·) "little": *(gwa)-xo* "a little" (no. 116)

The group **axwaˊ* seems to develop to Subtiaba *a·*, probably via *ahaˊ*:

a·- "not" <**axwaˊ* (no. 117)
a·- "two" in *a·-pu·* "two," *a·-su·* "three" <**axwaˊ-* (see nos. 101, 102): *ax-ku·* "four" <**aˊxwa-* (no. 103)

d-aca-lu· "grass," *m-a·ca* "green" <**aχwa´si* "grass," **m-aχwa´si* (and **m-a´χwasi* > **m-aχ^{u}si*?) "green" (nos. 38, 88); but if *-aca-*, *-a·ca-* are to be understood as *-a'ca-*, this example does not belong here

ϵ´ϵdi, *ϵ´'di* "blood" (read *ϵ·´'di*?) <**a·´'di* <**aχwa´'ti* (no. 3)

The loss of unaccented short vowels between consonants is a frequent process in Hokan dialects and probably accounts for most or all of the consonant clusters in these languages. Thus, Hokan **i´pali* "tongue" becomes *i´p'li* in Achomawi; Hokan **i´sama-* "ear" becomes **i´sma-*, whence Atsugewi *a´sma-k*, Achomawi *i´ssa-l*, Washo *d-a´mma-l* "to hear," Salinan *p-esna´-* "to hear"; Yana *xa´ga* "flint" corresponds to *dat'-xga´-i-si* "it has much flint." This process must have operated in countless Subtiaba words for which we have no evidence in Subtiaba itself. Frequently, as elsewhere, consonants thus brought together have become assimilated. In a number of examples we can surmise the former presence of these vowels from the comparative evidence given by forms in other Hokan languages, e. g.:

n^{v}aų "ear" <**i´mm^{v}a'nk* <**i´sma'lk* <**isama-* (no. 7)

-u·mi·u "navel" (read *-ummiu*) <**u´npi'w-* <**u´napi'w-* (no. 17)

ω·s'nko· "lizard" <**a´swa'nka'k* (no. 27)

i·na "leaf" (read *inna*) <**i´tna'* <**i´tana'* (no. 39)

u·n^{v}u "string" (read *unn^{v}u*) <**i´mm^{v}u'* <**i´pamu'* (no. 53)

aχku· "four" <**a´χ^{u}gwa'-k* <**a´χwa-wa'-k* (no. 103)

uχku· "moon" <**uχgwa'-k* <**u´χawa'k* (no. 40)

a·χka "spider" <**a´χaka'* (no. 24).

(*To be continued*)

ENTOMOLOGY AMONG THE BELLACOOLA AND CARRIER INDIANS

By HARLAN I. SMITH

THE Bellacoola Indians live in the Norway of Canada, about midway of the Pacific Coast, where Sir Alexander Mackenzie, the first white man to cross Canada, reached the sea; that is, about half way between Vancouver and Prince Rupert. Their country is around the head of the inlets about sixty miles in from or east of Ocean Falls and the usual route of the steamers up and down the coast. This inland passage is with few exceptions protected by the outer fringe of islands. The Bellacoola language is one of the Salish linguistic stock. The people are of the typical North Pacific Coast culture, characterized by the extensive use of red cedar and sea products, especially salmon, huge houses of split cedar planks with carved house posts, and totem poles, and immense seagoing canoes dug out of cedar. They were expert carpenters and had a peculiar art, especially in painting and carving, largely of conventionalized animal forms—a valuable contribution to the art of the world. This art may become of great financial value to the manufacturers of this country as well as a magnet capable of exploitation to bring in tourists with money from foreign lands. These Indians had a very highly developed social organization, many dramas and rituals, and a complex financial system popularly known as the potlatch.

The Carrier Indians of Ulkatcho, on the other hand, live in the high plateau of the semi-arid region, perhaps 75 miles northeast of the Bellacoola. They differ from the Bellacoola in language, appearance, and culture perhaps as much as do the Turks from the English. They had a less realistic art, which was largely geometric and pictographic, highly conventionalized and symbolic. Their social organization and financial system also were less highly developed.

From time to time during 1920-1923 inclusive, I have secured from both these peoples data about their use of materials. Part

of these data refer to insects, and may be of interest to entomologists, although my spelling of Indian words is very problematical, because some of the sounds I can neither hear nor make, and I am unable to record adequately many of those that I can hear. The data here given are preliminary to a complete working over of my notes, but are believed to be nearly complete.

Insects apparently were not so well observed by the Bellacoola as were useful mammals and plants, the stinger of the bumble-bee, for instance, being supposed to be in its mouth. Few insects had names, that is, mainly those which were used or which troubled the Indians. Insects were not used for food, and honey was unknown until after the coming of the white man. The head of the gad-fly was used as a pattern in painting designs, the nest of the yellow-jacket in sympathetic magic or witchcraft, and "fly spit" was said to be good for sores. They had a story about the bumble-bee.

Among the Ulkatcho also observation of insects was weaker than that of mammals and plants, and they apparently had names for only a few insects, those which troubled them. Ant lyon pits and its method of taking prey were known. Insects were of no use to the Ulkatcho whatever. An instance was observed of an Indian amusing himself with a buzzing fly held in his mouth. They employed smudges, fish oil, gum of the cottonwood, and blossoms of cow parsnip with oil to protect themselves from mosquitoes, black flies and no-see-ums, and smoke to protect foods from flies.

The Ant lyon, among the Ulkatcho, is called Kinnelkats. It is said to be numerous at Ulkatcho, but that it was useless and that there was no story about it. My informant voluntarily showed me the pits made by the larvae of this insect and, catching ants for the purpose, demonstrated its well-known method of taking its prey.

The grasshopper (*Orthoptera*), that makes a noise by rubbing its wings together when it flies, was called Telcus, among the Ulkatcho.

"Fly spit," that is the material surrounding a nymph of a spittle insect, also known as a frog hopper (*Cercopidae*), is said

by some old Bellacoola men to be good for sores, but my informant did not believe it.

Among the Ulkatcho it is numerous, but was not used, not even as a medicine.

A bumble-bee, identified as *Bombus appositus* Cresson, by Dr. H. J. Franklin, among the Bellacoola, was called Tikquanats or the large Skotl, Skotl being the name of three kinds of insects, a bumble-bee, a yellow jacket, and a hornet. It was not taken nor used, and was said to do no harm to people. My informant did not know whether it had a house or not. Neither did he know that it made honey until told so by white men. They say the bee took one of the prickers of the swamp gooseberry for a stinger, but my informant said he did not believe this. He thought it had a sting in its mouth, not in its tail, until I showed him. The Bellacoola have a story that a being considered by a little girl to be a man, but by an elder sister to be a bumble-bee, was once seen coming from the noonday sun. The little girl became blind, but her eyes appeared to be all right. Many thought she was made blind by too much sunlight when she looked at the man who was a bumble-bee.

Among the Ulkatcho, this bumble-bee was called Whultocho, *Whulto* being the name of a yellow jacket, and *cho* meaning large. *Whus* or *Whis* means pricker. The bumble-bee was not used as fish bait.

An insect, probably the hornet, is called Slow lowstl, by the Bellacoola, who say it has a little white on the tail and makes a small nest in a tree in July.

The yellow jacket among the Bellacoola was called Quolalaits (Clolaclaylaits) (Clolaclaylaits skotl) while all three kinds of insects, the bumble-bee, the yellow jacket and the hornet, were called Skotl. The yellow jacket was known to make a nest. The nest was used in sympathetic magic or witchcraft as follows: When one wished to cause the child of one's enemy to grow up to be a quarrelsome person, the nest of the yellow-jacket was burned and the ashes rubbed on the child. When the child grew up he or she would fight with everyone.

A fly which does not bite, perhaps the house fly among the Bellacoola, was called Mammish, and was said to lay its eggs on fish and fish eggs. The place called Numammish was so named because the people thought they saw flies and they said *mammish*, but when the supposed flies fell they were seen to be toads.

Among the Ulkatcho, this fly was called Asthuz, and was said to lay its eggs on salmon. To keep off flies of all kinds and mosquitoes the blossoms of the cow parsnip, *Heracleum lanatum* Michx, called Goosss in Ulkatcho, were put in oil of the eulachon fish or any kind of oil and the mixture was put on the body. Every food that was smoked was smoked so that flies would keep away from it. Flies were not used as fish bait.

The Gad-fly, *Tabanus* sp.? probably *sonomensis* O. G. of the family *Tabanidae*, which is commonly called horsefly, is numerous when the horses come down to Bella Coola from the interior. Among the Bellacoola it is called Silt lay estl. It is said to lay its eggs in the backs of the caribou in July, and these hatch into "worms." The face and eyes, being pretty, were used long ago as a pattern for a picture which was painted on fine boxes. There was no story of this fly.

Among the Ulkatcho, this gad-fly is called Clez co, and a smaller one is called Clez cho yaz, *yaz* signifying small. Once I was told that no medicine was used to keep off the gad-fly, but on another occasion that cottonwood gum with oil was used. Apparently for his own amusement, my Ulkatcho Indian informant held one of these flies by the abdomen inside his mouth and made it buzz.

Two kinds of little black biting fly, horse fly (*Symphoromyia* sp.?) apparently considered as one, are called Skikpie estl in Bellacoola. They are called Clez cho yaz in Ulkatcho *yaz* signifying small.

The Black fly, *Simuliidae*, among the Bellacoola is called Ticos cosee and Alk co ok hotl.

Among the Ulkatcho it is called Whuchu, while Tsih is the name of black flies, mosquitoes, and no-see-ums. All these were kept off with a smoke smudge made with a fire of any kind of wood on which were put such things as green, wet, or rotten wood,

or grass. Black flies were sometimes kept off by putting oil of either salmon or trout on the face and hands. Cottonwood gum with oil was also used for this purpose.

The No-see-um among the Bellacoola is called Sleigh et el ke.

Among the Ulkatcho the no-see-um is called Whetlcatl and it is said that the bite of this little fly causes swelling and sickness. It was kept off in the same manner as the black fly.

Mosquitoes, *Culicidae*, among the Bellacoola, were called Pikim.

Among the Ulkatcho they were kept off with smoke in the same manner as the black fly, and with blossoms of the cow parsnip in oil in the same manner as flies. It is not clear if the gum of the cottonwood was or was not used for this purpose, as it was to keep off no-see-ums.

Among the Ulkatcho "worms" were not used as fish bait.

VICTORIA MEMORIAL MUSEUM,
OTTAWA, CANADA.

REPORT OF A NEW DOUBLE CONOIDAL PIPE FROM KENTUCKY

By WM. S. WEBB

IT IS believed that the Indian Pipe shown in Figures 1, 2, is a good example of the Double Conoidal pipe as classified by McGuire[1] having, with the usual distinguishing characteristics, other interesting features.

This pipe was obtained from Mr. John Cinnamon, of Lawrenceburg, Ky., who found it while cultivating land on the farm of Mr. T. J. McCouan, one mile east of Farmdale in Franklin County, Ky. An old pasture which had been in bluegrass sod for many years had been ploughed up in the spring of 1913, and after ploughing, the sod was cut by a disk harrow. This pipe, covered with earth and clay, became entangled between neighboring disks of the harrow, arresting its motion. In removing this obstruction, this peculiar stone was discovered. When found it was not known to be of any historical significance, but because of its unusual form and color it was preserved in the home of the finder, serving for many years as a "door stop," a use to which it is well adapted, being roughly cubical in form and rather heavy, weighing 1212.5 grams (2.9 lbs.).

Notwithstanding this service, the manner of its discovery, and the probable fact that it has resided for perhaps hundreds of years in the surface soil, easily within the "frost zone" this specimen appears to be but little the worse for wear, showing only one relatively recent scratch, that on the base surface. Several small chips have been split from the edge of the base and one of the four engraved images is slightly marred, but all of this chipping has the appearance of great age, and points to the conclusion that practically all damage which has been done this specimen was sustained by it while still in the service of its prehistoric possessor.

This pipe was probably cut from a block of sandstone, and presents a general cubical appearance, having four vertical faces,

[1] Joseph D. McGuire, Report U. S. Nat.-Museum, Part 1, 1897.

each being an approximate rectangle. The base is 4-1/4 inches long from front to rear, and 4 inches broad. The height is fully 3 inches above the base section. The pipe proper rests upon a base section 3/4 inch thick, the outline of which is exaggerated by a deep groove cut parallel to the plane of the base, (see Figure 1). Portions of this groove seem to be worn, suggesting that it served a double purpose of outlining the base section, and also

FIG. 1. Back view of pipe.

providing an opportunity for attachment of a thong. Such a thong may have served as a means of carrying the pipe or as a simple attachment to any other form of support.

The four faces of the pipe rise from the base almost perpendicularly. Into the rear face is cut the large conical stem hole, the diameter of which at the face is 1-3/8 inches and decreases to 1/4 inch diameter at a depth of 1-1/4 inches. The stem hole is almost an exact duplicate of the bowl, which has the same depth and slope of side. These two conical drillings could have been made by the same blunt reamer. That they were originally

reamed out is clearly shown by the circular grooves still existing in the conical face of the stem hole. However, the main bowl shows several vertical grooves also, which appear to have been made with a blunt instrument used as a chisel. Such grooves could easily have been made in cleaning the bowl by scraping, possibly after the pipe had been used. The grooves in both bowl and stem hole appear to be quite as old as the other surface of the pipe,

FIG. 2. View showing carved medallions.

and were evidently made either by the maker or the prehistoric user of this specimen.

The material of this pipe was originally a rather heavy sandstone, probably having a large iron content, probably carbonate of iron. The sandstone has undergone a change, (after the manufacture of the pipe), as the result of being hundreds of years in the soil, not deeply covered, and exposed to the action of the air and soil water. The specimen has become covered with limonite ($2Fe_2O_3 3H_2O$) to a depth of 1/16 inch or more, giving the pipe a fairly smooth hard surface, dark red in color. This coating gives

the characteristic red line when rubbed on unglazed porcelain. Professor McFarland of the Department of Geology of the University of Kentucky who kindly examined this specimen expressed the opinion that this coating may have been derived from carbonate of iron in the original sandstone, by oxidation and weathering to limonite, or it may have been deposited on the sandstone as the result of the action of soil water, rich in iron content. The present density of the specimen is 2.24. The actual water displacement volume is 541 c.c.

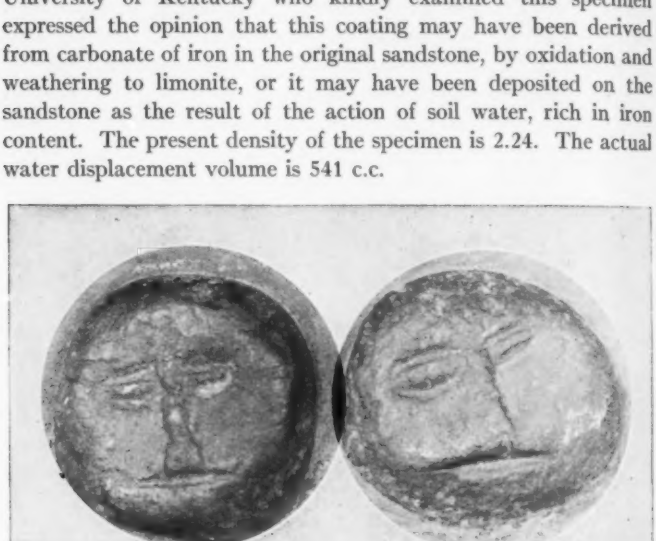

FIG. 3. Detailed view of medallions.

Perhaps the most interesting feature of this specimen is the medallion-like disks raised nearly 1/4 inch above the face of the pipe, one on the right and another on the left face of the pipe as one views the stem hole. Upon each of these raised disks is engraved a human face. Figure 3 shows these two disks, side by side for comparison.

This engraving was done by deeply incised lines, the eyes being each represented by crescentic lines concave toward each other. The nose in both images is rather boldly represented by a raised triangle, extending from between the eyes, base downward, completely to the deeply incised line representing the mouth. In both figures the surface of this triangle is broken by

a slight increase in elevation, giving to this nose the "Roman" form.

On the front face of the pipe, the side opposite the stem hole, are to be found two raised figures, one a face carved similarly to the medallion-like disks, but being in such high relief as to appear almost like a spherical head. A second image representing a head and form of body also raised in high relief appears on the front face of the pipe (see Figure 2). These two images are much less carefully wrought out than the two side carvings, and the features of the nearly spherical head are slightly marred as described above, by an apparently old injury.

The base of the pipe has a slightly convex surface, and it would appear that the surface was once smooth and had a fair polish, if we may judge by a portion of the surface remaining. However, in almost the exact center of this surface there is a large pit, nearly one inch in diameter and almost 1/4 inch deep giving to the basal surface the usual appearance of a hammer stone. It is not at all impossible that the pipe might have been so used. Because of its shape it was fairly easy to hold in the hand, and because of its weight it might easily have served to crack nuts, or buffet a stone chisel, it being not an unusual thing to find evidence that among stone age men one tool served two or more purposes.

When we consider the rather considerable weight of this specimen, one wonders how it was supported while in use as a pipe. Perhaps the large pit hole in the basal surface, and the groove about the basal section could be explained on the basis that they enabled the user to attach it by means of a thong to a support, perhaps to the end of a small post, the other end of which could be easily set in the earth. One is tempted to speculate as to whether or not this specimen was really a pipe as we ordinarily understand the term. The fact that as a pipe it appears unwieldy, and that it may have been designed to be supported on a vertical post, suggests that it might have served in some ceremony, religious or otherwise as a small altar, from which smoke was expected to rise at an appointed time. Because of the size of the bowl, a very considerable amount of combustion could

take place, especially if assisted by blowing through a hollow cane presented to the very large stem hole.

The pipe is now in the private collection of the author and is believed by him to be much older than any of the hundred or more Kentucky pipes in this collection. So far as he is aware, this form of pipe has not heretofore been assigned to any particular linguistic group, tribe or culture.

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BOOK REVIEWS

METHODS AND PRINCIPLES

Human Origins; A Manual of Prehistory. GEORGE GRANT MACCURDY. New York and London: D. Appleton & Co., 1924. 2 vols., LIV, 956 pp., 410 illustrations. Price, $10.00.

There being available already about twenty general treatises on European prehistory, mostly of recent date, the man who proposes to add yet another to the list should, it would seem, have some special reason for doing so. Fortunately, the present author, Research Associate with professorial rank at Yale University, possesses all the excuses necessary under the circumstances in the shape of special qualifications for the task. He has given, as he says, all of thirty years to the patient accumulation and study of the great multitude of facts upon which rests today the illuminating account of early man and his culture. Indeed, it is entirely safe and proper to say that no other professional student in America, or in Europe either for that matter, has a first-hand acquaintance with the facts in question equal to that of Dr. MacCurdy. American anthropologists, therefore, while leaving congratulations to others, may take genuine satisfaction in that one of their number has been enabled finally to finish this long contemplated work.

The two sumptuous-looking volumes appear to contain everything that could be expected, from Preface to Index, including such features as a five-page analytical Table of Contents, eleven pages of glossary, various bibliographies, three appendices covering 178 pages, and an index of 38 pages. The work is liberally, almost lavishly, illustrated; and the mechanical quality of these illustrations, as well as of the typography itself, seems all that could be desired.

Volume I, devoted chiefly to Paleolithic man, opens with a historical introduction giving a brief account of the rise and development of prehistoric archaeology, the results of which are summed up in the still briefer form of chronological tables. The second chapter treats of the Ice Age and its bearing on man's antiquity, the discussion being re-emphasized and clarified by means of correlation schemes. Chapters three to six, inclusive, are devoted respectively to the

Eolithic Period, the Lower Paleolithic, the Mousterian Epoch, and the Upper Paleolithic Period. The treatment here conforms in all essentials to the now practically stereotyped plan followed by all the compendium writers. That is, for each culture level the principal forms of artifacts are named and illustrated, their modes of occurrence are given, the accompanying faunas are listed, and something is afforded by way of outline schemes and maps to indicate the probable distribution of the given culture over the Old World at large. Chapter VII, covering about 86 pages, presents an excellent and comparatively original account of Paleolithic art. This account, while necessarily limited, gives through both text and illustrations a clear idea of all the successive phases of sculpture, engraving, and painting. The very latest finds and determinations are included. Tabular analyses with maps showing the geographic occurrence of various typical representations, such as the human form, the horse, etc., are given; and all other organisms, animal and vegetable, treated by the cave artist, as well as the more distinctly ornamental designs of geometric character, are duly dwelt upon. Altogether this strikes one as the most appealing subject dealt with in the book. In Chapter VIII under the title of Fossil Man the author furnishes a complete descriptive catalogue—fully 130 pages long—of all the known skeletal remains of early man and his progenitors, together with brief citations of the prevailing opinions regarding the character and value of the data. An additional short chapter summarizes the outstanding characteristics of the Old Stone Age and closes the volume.

The second volume treats in 296 pages (Chapters X to XV) all the remaining divisions of prehistoric time. Thus a short chapter is devoted to the Transition Period, in which have been included the Azilian-Tardenoisian and Campignian culture phases. The Neolithic Age comprises two long chapters, one descriptive and the other explanatory in character; while the Bronze and Iron ages receive each a chapter of moderate length. The work proper ends with a very brief chapter describing the physical characters of post-Pleistocene man. All the rest of the volume, some 220 pages, is given over to index and appendices. One of these latter furnishes interesting legislative data regarding European classification and preservation of antiquities; another lists the principal art objects and the sites at which they were obtained; while the third and most valuable gives, in brief outline form, all the important archaeological stations which have yielded stratified remains, together with notes on their discovery and

exploration, as well as citations of the principal bibliographic references pertaining to each.

A work of such scope and size as the above is entitled to more extended and judicious comment than the reviewer is in position to accord at the present moment. I have faithfully read it through; but as I have never done as much for the similarly comprehensive treatises by Déchelette and Hoernes, I have no clear conception of what it may be right to expect. What is a manual, a handbook, a summary treatise? For whom, precisely, is it written? It happens that I have already found this work useful in connection with the classification of certain museum specimens; but I trust that for every museum man who is likely to use it in this country the work will be perused by some thousands of university students and general readers. In other words, I take it that the presentation is designed to serve the wants of the great mass of intelligent readers who have no access to actual museum collections but who, for a correct idea of the data considered, must rely on illustrations. That being the case, one is moved to say that in spite of the liberal and generally judicious use of illustrations, something further is still to be desired along that line, especially in the second volume.

Broadly stated, the textual and illustrative presentations in the second volume are both much less complete and systematic, as well as more uneven in quality, than is the case with the first volume. Some important, i.e., chronological guide types of artifacts, are not illustrated at all; while certain other types are perhaps over-illustrated. This is noticeable from the Azilian-Tardenoisian chapter onward. But there are places also in the first volume, such as on page 92 or 93, where a diagram seems badly needed to illustrate the relations of deposits there cited. To compensate for such additions, one of the two illustrations of the Tuc d'Audubert cavern entrance, e.g., could well be omitted. In place of illustrations some sort of table showing the time of appearance of new implements might serve.

The author, obviously, has had some difficulty or has been uncertain with regard to the proper treatment of his subject from the end of the Magdalenian culture onward. It does not seem quite correct, for instance, to group the Campignian with the Azilian-Tardenoisian. The one culture was hardly derived from the other: there was a hiatus of some sort between them which is yet to be explained. Again, in treating, for example, of the Iron Age, the data, say for Sweden, receive no mention, the facts considered being

derived almost entirely from central Europe, including Switzerland and France. No doubt the difficulty of handling at once so many localized cultural variations is great; nevertheless, striking similarities are also present, sufficient at least to give uniformity to several general changes passing over the whole of Europe—as for example burial methods—and should receive due consideration. As for the differences or the contemporary modifications involved, these could profitably have been set forth either by illustrations or else by brief tabular schemes. But as a matter of fact the volume affords ample room for textual treatment, if necessary at the expense of certain of the appendices.

Of minor errors of omission and commission it is not necessary to write here in detail. Slips, typographical and otherwise, are comparatively few. One may, however, question the advisability of some of the French terminology which has crept in, such as *couche*, *mêlange*, *non-remanié*, *pression*, *champhere*, etc. On the other hand, Dr. MacCurdy's new interpretation of coup-de-poing as "cleaver," while suggestive, can probably do little more than add to our bewilderment. I note the omission of reference to shell-mounds in the introductory chapter and have been told of the omission also of certain important Paleolithic stations in Austria. For myself, I regret the omission of some introducing note or paragraph to the chapter on Eoliths—something to help the general reader appreciate the significance of the facts he is about to encounter. I question the correctness of the introduction of the horse into Egypt as early as 2300 B. C.; likewise the spelling of "pole" as referring to axe blades; and also the propriety of devoting several paragraphs to a description of the Ipswich skeleton and its discovery, the whole to be dismissed in the last sentence by the statement that the discoverer has withdrawn his claim and the find is in the discard. Lastly, the omission of specific bibliographic references will probably be regarded as a serious fault by many. But after all, in a work which probably contains more well-ascertained facts than any other ever written on the subject, some defects and errors are to be expected.

Taken as a whole, Dr. MacCurdy's work impresses one primarily as a presentation of facts. This is precisely what it seems to me a manual should be; and it is as such that it fills a distinct want. Interpretation is a very desirable thing, no doubt; but we have already several books of that type and may expect many more, for those are comparatively easy and pleasant to write and, as a rule,

correspondingly ephemeral in value. So, while one may register disappointment that the author did not come out in the open to tackle, for example, Reid Moir and his extraordinary revision of Paleolithic and pre-Paleolithic chronology in its relation to geologic chronology, on second thought it seems as well that he should not have committed himself on topics still under discussion. Indeed, if the work under consideration is open to criticism, it is in reference to occasional seemingly too positive interpretations, such as a thorough-going ethnographer would avoid.

N. C. NELSON

The prehistory of man—the study of his physical, mental, and cultural development through the ages preceding the earliest recorded history—may well claim a place among the younger sciences, seeing that a century has not yet passed since it received general recognition as an accredited subject for serious scientific research. Nevertheless, the subject is of such general and commanding interest, its followers so eager and untiring in their efforts to trace the dim back trail of humanity, that every succeeding decade adds appreciably to our knowledge, and thus, in the course of a few years, the earlier accounts are rendered incomplete or even antiquated, and there is a constant demand for the latest results of investigation. A welcome addition to the most recent literature on this subject is the *Human Origins* of Professor George Grant MacCurdy of Yale University, who, in the two volumes of this "Manual of Prehistory" has summed up the results of nearly thirty years devoted to research, personal observation, and excavation in the European field. In the first volume he discusses "The Old Stone Age and the Dawn of Man and His Arts," devoting chapters to the development of prehistory, the chronology of the Glacial Epoch, the industrial stages of the Eolithic and Lower, Middle, and Upper Paleolithic periods, Paleolithic art, and fossil human remains. The second volume deals with the transition from Paleolithic to Neolithic, and the Neolithic, Bronze, and Iron Ages, including contemporary human skeletal remains.

In discussing fossil man Professor MacCurdy speaks but slightingly of the attempted reconstructions made by other anthropologists. He admits that they may serve to stimulate interest, but feels that they are apt to be misleading, and are at best "a mass of hypothetically coordinated details superficially stamped with all the precision

of a genuine portrait." There is no doubt that, as he says, "both by inclination and training we are more critical of human representations than of any other," and no one will deny that in such reconstructions the size and shape of the mouth, lips, ears, and soft parts of the nose, color and texture of the skin, blondness or brunetness, character and abundance of hair, are all matters which can only be hypothetic, as there is no satisfactory evidence. Nevertheless, when it comes to modeling the top and back of the head, the slope of the neck behind the ear, the brow, temple, cheek, and chin, the artist is on sure ground, and who shall say that he does ill to complete the picture by supplying the remaining parts and thus offering a suggestion as to what the whole might be, so long as he is careful to make it clear where fact ends and conjecture begins?

In truth, Professor MacCurdy's *Human Origins*, or any other manual of prehistory, is neither more nor less than just such a reconstruction, in which the known facts are recorded, and the gaps pieced by conjectures and hypotheses worked out after cautious and painstaking study. In western Europe a homogeneous succession of industrial stages has been demonstrated, and a number of human fossils of Pleistocene age have been found associated with faunal and cultural remains. Amazing specimens of Paleolithic art have been discovered—both portable and stationary—in many cases under such circumstances as to preclude assigning them to any later date. With these known facts for foundation the prehistorians have spared no effort to build up a convincing picture of the life and development of primitive man. The religion and psychology, the tribal organization, industries, cults, and practices of existing primitive peoples have been studied, geographic and climatic changes of Pleistocene time have been considered, evidence afforded by the fauna and flora of the glacial and interglacial stages has been weighed, and from all this has been developed a hypothetic reconstruction of the probable environment and nature of prehistoric man. And again we ask, who shall say that this is ill done, or be other than grateful for the effort that sought to give us, as far as possible, a faithful portrait of our forebears?

In common with many other prehistorians, Professor MacCurdy seeks to harmonize the fourfold evidence of geology, paleontology, archaeology, and anthropology in regard to prehistoric chronology and environment. It is obvious that each of these four sciences has essential evidence to contribute concerning the past of humanity—the

extent, character, and climate of the land in which man lived, the animals that he hunted or that hunted him, the tools and weapons that he used, and his physical structure. But it is to be regretted that this wholly praiseworthy attempt to correlate the evidence of four separate sciences should have introduced an unfortunate confusion of terms. Such phrases as "Eolithic race," "Mousterian fauna," "Cro-Magnon mural art," are frequent in the literature of prehistory, but they do tend to obscure the force and bearing of the evidence adduced. Let us hope that a time may come when the names of geologic periods, Pleistocene faunas, industrial stages, and human races will no longer be interchanged.

In the chapter on the Ice Age it may be noted that the *nevé* is the field of closely packed, granular snow which is the source of a glacier. It is not the glacier proper until it has been subjected to sufficient pressure to change it into ice, after which it is no longer nevé. Of course the nevé lies above the snow line, and sometimes part of the glacier as well. But the difference between the nevé and the body of the glacier is not a difference in elevation but a difference in compactness of texture—the difference between packed snow and solid ice. Professor MacCurdy is so up to the last minute in regard to the postglacial phases in Scandinavia according to the recent researches of De Geer and Antevs, that it is somewhat of a surprise to find him retaining the Laufen retreat in his chronologic calculations. It would also obviate confusion if the chronologic tables given on pp. 26-27 showed that Holocene and Pleistocene are two subdivisions of the Quaternary, and Tertiary and Quaternary two subdivisions of the Cenozoic.

The existence of a "Warm Mousterian" is a debatable ground for prehistorians. The Warm Mousterian stations named by Professor MacCurdy are at Montières, Villefranche-sur-Saône, La Ferrassie, La Micoque, Laussel, Grimaldi, Krapina, Taubach, Ehringsdorf, Cotencher, Drachenloch, and Wildkirchli. The three last-named sites are in Switzerland well within the limits of the last Pleistocene glaciation. The grotto of Cotencher was over 1300 feet below the extreme elevation of the Rhone glacier during the Würm maximum. At all three stations the industry and faunal remains were similar. The industry has been called Mousterian but is not typical. Professor MacCurdy classes it as such, and assumes that these stations could not possibly have been occupied except during a warm interglacial stage. But surely even the severities of a glacial

stage could hardly have offered insuperable difficulties to hardy Paleolithic hunters adventuring into the mountains in summer in quest of food. The game they hunted consisted almost entirely of cave bear, and it would seem that the evidence afforded by the position of the stations and by the cultural and faunal remains is insufficient either to prove or disprove the existence of a "Warm Mousterian." The industry found associated with human remains at Krapina, Taubach, and Ehringsdorf has been variously identified as Chellean, Acheulean, and Mousterian. It is agreed that it is not a typical and unmistakable Mousterian. Therefore no positive conclusions in regard to a Warm Mousterian can be drawn from the associated fauna. As to Grimaldi, it might reasonably be expected that even during a glacial stage a warm fauna might manage to survive at so sheltered and southern a site. The list of Warm Mousterian fauna on p. 142—which presumably applies to all the stations cited, including those in France—names the elk, bison, beaver, roe deer, cave lion, and wild boar, none of them especially characteristic of a warm climate. Five other species listed appear also in the list for the "Cold Mousterian." There remain just three—*Elephas antiquus*, *Rhinoceros merckii*, and *Hippopotamus*. The present habitat of these genera is in a warm country, but observers tell us that, like many other large mammals, they are comparatively indifferent to cold. To what degree the Pleistocene species named above were tolerant of cold we do not know, nor can we do more than guess at the summer temperature of the Somme and Saône valleys during glacial times. It would therefore seem that as yet the case for the "Warm Mousterian" is not proven. It is a hypothetic feature of the prehistoric reconstruction.

Quite the contrary is the case of the cold fauna accompanying the Mousterian, and the succeeding Late Paleolithic industries. Here the prehistorian has abundant indisputable evidence for the presence of an Arctic-Alpine fauna associated with human cultural and skeletal remains.

Again, the association of Heidelberg man with the Pre-Chellean industry is purely hypothetic. There is no evidence either to prove or disprove the possibility. On the other hand, the association of Neanderthal man with Mousterian industry, and of Crô-Magnon man with Aurignacian industry, is beyond dispute.

In describing the fossil human remains it is unfortunate that the skulls pictured were not posed according to the Frankfort convention,

so that the actual degree of prognathism and other features mentioned in the text might have been more apparent. The Brünn skeleton could hardly be referred to the Aurignacian merely on account of its being stained with ocher, for the mortuary bed of ocher occurs in sepultures of Aurignacian, Solutrean, Magdalenian, and Azilian times, as Professor MacCurdy himself shows. The character of the associated artefacts would be a more reliable basis of diagnosis.

It is in the diagnosis of artefacts, the description of implements characteristic of the various cultural phases, that Professor MacCurdy excels. His chapter on the Eolithic Period is conspicuous for its clear and conservative presentation of a very difficult subject. The same conservatism marks his discussion of "figure stones" in the opening of his chapter on art. Indeed, in all the text relating to cultural and artistic remains one feels that he speaks of what he has seen and handled, and the caption of many an illustration closes with "Photograph by the author." The successive Paleolithic industries are fully and understandingly described. Perhaps there is too much emphasis laid on the cultural change from Mousterian to Aurignacian. It is one of the puzzles of prehistory that the great changes effected at this time—the change from the Neanderthal to the Crô-Magnoir race, the introduction of an extensive industry in bone, and the birth of art—should coincide with a natural and apparently gradual evoution of the Mousterian stone industry into the lithic types of the Aurinnacian. Here alone there would seem to be no pronounced breag. The chapter on Paleolithic art, beside the descriptive text, includes admirable classified lists of the various subjects, and the sites where they are portrayed.

The second volume, dealing with the transitional industries and the Neolithic, Bronze, and Iron ages, is of necessity limited to a very sketchy and general treatment. When man ceased to be dependent on hunting animals for food, and herded and pastured them instead, when he learned to supplement this food supply with cultivated plants, he bound himself as never before to a settled habitation. And thus, from the comparatively homogeneous culture of the Old Stone Age there developed numerous local phases during the succeeding ages of Polished Stone, of Bronze, and of Iron, each with strongly marked characteristics and following its own line of evolution, which makes the task of synchronizing them a difficult one. Moreover the cultural and skeletal material for these periods is so abundant as to demand many volumes for even a brief description. Professor

MacCurdy has achieved a brilliant success in effecting the necessary condensation, and nevertheless contriving to present the most important features of man's industrial and social evolution from the close of the Old Stone Age on to the dawn of history. These offer problems of interpretation quite as perplexing as any found in the earlier stages, as, for instance, the designs from Gavr'inis and the Table des Marchands pictured in figures 301 and 302, which Mac Curdy takes for representations of a hafted ax, and a shield ornamented with ax handles. Other observers see in the design from Gavr'inis a primitive plow, and explain the groups of "ax handles" on the supporting stone of the Table des Marchands as conventionalized blades of wheat. The latter view is somewhat helped by the fact that a disk with rays, supposed to represent the sun, is indicated in the middle of the "wheat stalks." This does not appear in MacCurdy's figure reproduced from de Mortillet, but is clearly seen in a photograph of the same stone by le Rouzic (1910). A few phrases, such as the "prow lines of the stern," or "some rodent, probably the marten" are obviously oversights such as will at times escape the vigilance of author and editor and slip into the best regulated book.

To sum up: Professor MacCurdy's account of prehistoric man does not always make clear the part that rests upon indisputable evidence, and the part where the insufficient evidence has been pieced with hypothesis and conjecture. In this respect it will present grave difficulties to beginners in prehistory, not yet familiar with the nature of the supporting evidence. On the other hand, the exceptionally ample and accurate lists and classifications of sites given throughout the text and in the appendices are invaluable, not only to beginners but to everyone who has occasion to verify localities or references.

No report on *Human Origins* would be adequate that failed to do justice to the extraordinarily sympathetic comprehension with which Professor MacCurdy pictures some of the salient features of man's early development. Take, for instance, this passage from his chapter on Paleolithic art:

> From the standpoint of priority of antiquity then, the artist has special reason to be proud. He follows a calling that had its worthy devotees ages before any other method of leaving imperishable records of human thought was known. Man was artist before he was the maker of even hieroglyphs; he tamed his imagination and his hand to produce at will objects of beauty long ages before he tamed the first wild beast or made the humble plant world

do his bidding. The farmer, whose calling we are apt to think of as representing the life primeval, is a mere upstart in comparison with one who practices the fine arts.

Both Professor MacCurdy and the readers of "Human Origins" are to be congratulated on this new, vivid, and scholarly reconstruction of the life and environment of prehistoric man.

C. D. MATTHEW

Medicine, Magic and Religion. (The Fitz Patrick Lectures delivered before The Royal College of Physicians of London in 1915 and 1916.) W. H. R. RIVERS. With a preface by G. ELLIOT SMITH. New York: Harcourt, Brace and Company, 1924. VIII, 147 pp.

The major part of this little book presents a history of primitive and early medicine. It shows the late Doctor Rivers at his best, and we must all feel indebted to his literary executor, Professor Elliot Smith, for having rescued these fugitive essays and made them generally accessible. So far as I know, this is the only serious attempt to characterize the major areas of the globe with reference to theories of disease and the correlated practices. A pioneer effort of this sort is bound to err on particular points, but Rivers's sketch remains a highly creditable undertaking.

The most serious mistake I have noted relates to the distribution of the belief in soul-kidnapping as the cause of illness. Rivers thinks that it is limited to Indonesia, Papuo-Melanesia, and America, with traces in West Africa, but writes: "We do not know of it in Asia . . . . " (p. 79). The fact is that it is prominent among the Chukchi; and likewise, I learn from Doctor Sternberg, among Mongolic and Turkic peoples. In view of Doctor Rivers's implicit rather than expressed tendency to connect American and Indonesian culture, the *continuous* distribution of the trait on both sides of Bering Strait is a phenomenon of considerable significance. In general, Doctor Rivers's exposition of most points in this book is characterized by commendable restraint, though the very formulation of certain questions—for instance, as to the single or multiple origin of Four as a sacred number (p. 88)—indicates his sympathies.

The distribution of the sweat-bath in Melanesia, New Guinea, Polynesia, Africa and America, as well as in Northern Europe, (p. 102) is certainly highly suggestive and merits closer study. It may be worth pointing out that the sweat-bath is not always a *vapor*-bath

in America, as Doctor Rivers seems to assume. Altogether the treatise suggests many special inquiries of ethnographic interest and contains much valuable detail on the Oceanian area with which the author was particularly conversant.

ROBERT H. LOWIE

AMERICA

The North American Indian. EDWARD S. CURTIS. Volume XII: The Hopi. 1922.

Among all the voluminous ethnographical literature concerning the Hopi there has been till now no orderly survey of their complex culture. It has been the simplest things about their life that one learned last of all, accidentally usually in the mass of specialized ceremonial detail. It is only with the publication of the latest volume of this series sponsored by J. Pierpont Morgan, *The Hopi*, that this is ended. The book is a clear and observant record of the various aspects of their life.

It is of course as beautiful a volume as our libraries boast, and one that is written lucidly and with competence. From an anthropological point of view it performs two major services: it is, first, that much needed summary of a Pueblo culture, the only one that has ever been done that will serve as an introduction to their habits of thought and is yet of such completeness as to be ethnographically of value; second, it contains a very considerable amount of new or variant material of comparative interest.

As a summary of a Pueblo life it is as successful as a strictly descriptive book well might be. The account of the katcina cult, for example, (pp. 170-177) with the generalized description of procedure and its intimate association with the kivas, is admirable. It is just such an account as a sympathetic and intelligent inquirer has need of. The shortcomings of the book as an introduction to Pueblo life arise as a defect of its virtue, for it is wholly descriptive, and it does not make any attempt other than lucidity of statement to guide the student through the unaccustomed mazes. It would have made the large patterns of their culture clearer to set off the katcina cult, for example, somewhat definitely from their other fraternity-organized activities of curing and weather-control; and it would be helpful to find an analysis of the various organizations of the kiva, and the

fraternity, and the clan in their several functions in everyday life. Such a plotting of distinct activities and thought-patterns is outside the scope of the book.

This straightforward setting down of information, on the other hand, makes the ethnographical information exceedingly easy to use as comparative material. The account of his initiation by the only surviving member of the Poswimi, the extinct curing-society of medicine-men, fills an important gap in the so-far recorded material. This society was made up of a very small number of initiated medicine-men who met at the time of the winter solstice ceremony, "looked through people" in the performing of their cures, and initiated by clapping a crystal "heart" into the breast of the initiate. The likeness to the practices of Zuñi and eastern Southwest curing societies is borne out also in the choir of five who sang for them at their ceremonies. Some relative of the newly-initiated medicine-man was supposed to die in consequence of his initiation.

The clan data presumably refer to Walpi alone, and in view of the wide discrepancies in the various pueblos, it would have been helpful to have had it specifically assigned to this village. The date at which it was collected would also have been valuable, for Mr. Curtis and Mr. Myers made their first trip to Hopi in 1900, and have gathered material at intervals ever since. We have the list published by Dr. Fewkes in 1900, and a recent unpublished list of Dr. Parsons, and a comparison of the three emphasizes the stability of the native groupings of the linked clans. In all three lists there are some singly-mentioned variants that do not occur in the others, but the main alignment into twelve groups of linked clans is stable. The main divergence of the Curtis list from both others is its omission, for the Bear group, of the usual linked Bluebird-Spider group, and the substitution of Hemlock.

Hopi proper names are clan-owned, but they are not the property of the clan of the man or woman who bears the name, but of the clan of the man or woman who bestowed it. Curtis has included a valuable list of 120 names with their translation and clan-ownership, and the clan affiliations of the person who bears the name, both on his father's and his mother's side. The majority of the names are given by the father's clan, and in some groups this is overwhelming. Of twenty-eight names owned in the Tobacco-Rabbit clan, twenty-six are borne by children of Tobacco men. Nevertheless in a total of 120 names

recorded, only 77 are borne by "children of the clan." In Sichumovi, at least, according to Dr. Parsons, the person bestowing the name is the ceremonial father who takes the child through the Powamu whippings, and initiates him into his own New Fire Society. If this is true also in Walpi, it will give a valuable indication of the relative frequency of different methods of affiliation with these societies. It seems that in Hopi theory the ceremonial father is from the maternal household of the father, but we know also that a sick child may be "given" to a person of unnamed affiliation to be initiated by him, if the child is cured, into the New Fire society of which he is a member. The trespass initiation is recorded also. The bearing of all these upon the clan-owned name should be enlightening.

This table of clan names is recorded in connection with a genealogy of 221 names, which was used in the gathering of kinship terms. Not only the use of these which accords with native theory is given, but also the secondary applications as shown by the terms which were applied to each other by the persons in the genealogy.

Confirmation is given of the practice of removing the fangs from snakes before the Snake dance. The method is that described in the confessions owned by the American Museum of Natural History. As a whole the descriptions of ceremonial are valuable as introductions, rather than as adding to already known detail. Some things of considerable significance escaped the attention of the authors, such as the clan basis of organization for the winter solstice ceremony.

The volume contains also valuable mythological material. The clan myths, compared with those already published and with Miss Ruth Bunzel's manuscript, are in their diversity of inc dent a self-sufficient rebuttal of their historicity. Among the incidents of the other tales never before recorded for the Hopi is the omnipresent Pueblo story of the marriage-test in which the fine-ground meal must adhere to a polished shell; and a well-acculturated variant of the northern incident of compassing your enemy's death by a contest in swinging from a tree that snaps back with great force.

All anthropologists are under a debt to Mr. Curtis and Mr. Myers for this volume, and we must regret that it is so rare and precious a book as not to be available for ready use. It should be accessible not only to anthropologists, but to their students, and to all who are interested in a complex and integrated culture.

RUTH F. BENEDICT

Shoshone Folk Lore. SARAH EMILIA OLDEN. Morehouse Publishing Co., Milwaukee, Wis.

The hopes that are legitimately raised by this title are not even known to the author. It contains no folk-lore and its desultory observations on Indians and missions are poorly reported.

R. F. B.

An Introduction to the Study of the Southwestern Archaeology. Papers of the Southwestern Expedition No. 1, New Haven, 1924. A. V. KIDDER.

Dr. Kidder's book is a vivid reminder of the progress which has been made in the archeology of the Southwest during the last fifteen or twenty years. The foundation for this work was laid somewhat earlier by Bandelier, who during the years 1880-1886 explored the Southwest for the Archeological Institute of America. The Hemmingway Expedition to the lower Salt River was made in 1887-8. The Mindeleffs, Mr. Pepper, and Dr. Fewkes did much pioneer work. The new era, however, began with Dr. Kidder and Mr. Nelson in the Rio Grande region. The first main problem was to separate geographical variations from historical sequences, and chiefly on the basis of pottery. Dr. Kidder obtained noticeable results in the Pajarito region and Mr. Nelson worked out the first satisfactory sequence in the Galisteo Valley. Later both these men covered practically the whole of the Southwest. In time it is probable that both would have presented pretty complete solutions of the development of culture in this region if circumstances had not diverted Mr. Nelson to other problems. To the aid of these pioneers came Earl H. Morris in the San Juan region, Leslie Spier in the Little Colorado, and Neil M. Judd in the Chaco Canyon. Working more or less with Dr. Kidder, Guernsey made important contributions in the region of northern Arizona and southern Utah.

The results of this work are presented in this preliminary publication of a series that will deal in particular with the excavations at Pecos. The first part gives the available history of Pecos beginning with the Coronado Expedition in 1540 and following the course of events until the village was abandoned in 1838. Part Two gives an account of the excavations at Pecos for Phillips Academy continuing through the six seasons from 1915 to 1922 (1918 and 1919 being

omitted because of the war). Part Three begins with a concise description of the modern pueblos and then takes up the prehistoric ones in geographical order: the San Juan, Northern Peripheral District, the Little Colorado, the Upper Gila, the Mimbres, the Lower Gila, the Chihuahua Basin. The architecture and pottery of each province are described and characterized with interesting comparisons especially as to contemporaneity. These presentations are greatly aided by the numerous illustrations and maps. The well-selected series of pottery designs in particular make comparisons easy.

It is in the San Juan region that historical sequences are particularly well worked out. The distinctions between Basket Maker, Post Basket Maker, Pre-Pueblo, and Pueblo are now pretty well determined for dwellings, clothing—especially sandals—and pottery. The Pueblo period is probably susceptible of historical subdivision but here there is still some confusion between local variations and time sequences. The main differences between Mesa Verde and Chaco Canyon are certainly for the most part local. It is this determining of sequences by careful observations and analyses that crowns the archeological work in the Southwest. This is at the same time brilliant and accurate. It is also a fine example of cooperative effort. There has been constant consultation between the various workers in the field with a frank sharing of new facts and theories. Petty jealousies are conspicuous by their absence.

Besides the San Juan and Rio Grande regions in which the main historical results have been obtained notable work has been done in the Little Colorado; Kroeber, Nelson, and Spier have made general surveys. Spier by clever analysis has been able to determine the order in time in which the various ruins in the neighborhood of Zuni were inhabited. Mr. F. W. Hodge during his excavation of Hawikuh for the Museum of the American Indian Heye Foundation has been able to trace back from historical times the changes in pottery, burial customs, etc.

To the south very little is known. Museums have collections of fine pottery from the Upper Gila and Mimbres Valleys but information as to these regions is very scanty. From the lower Gila and Salt Rivers both specimens and facts are few. The Peabody Museum at Harvard has the results of the Hemmingway Expedition concerning which the publications were meagre. This region should prove a fruitful field because it lies along one of the roads to Mexico, and may have received early influences from the South.

Part Four is devoted to conclusions. Dr. Kidder sketches historical changes from a postulated non-agricultural, nomadic people to the highly concentrated community life represented in Chaco Canyon and the Pajarito plateau. He leans toward the pressure of alien tribes from the north and east for an explanation of this concentration of population and the final abandonment of large areas. There are no evidences of any considerable changes in the rainfall or climate of the Southwest. It may be more stress should be put upon the economic advantages of community life and the advancing knowledge of agriculture which led to the irrigation of the less elevated regions in the place of isolated dry farming in the mountain valleys. The changes in historical times were due to the raids of non-pueblo peoples and it is sound to postulate the same cause for more remote movements. The penetration of the Navajo in the north and the Apache in the south may well explain the deserted ruins in Chaco Canyon and the upper Gila.

The making of time estimates by Dr. Kidder and others for prehistoric events in the Southwest seem to me hardly justified. There is at present no basis for a reckoning in years. The assumption that the development of American culture and the great linguistic variation in the two continents have resulted since the retreat of the last ice cap far enough to open a road across Behring Sea is untenable. The ruins of Mexico Valley, the Maya region and the Andes may be recent, but beneath all these lies the long upward struggle of the beginning of agriculture and the arts.

The book is most welcome for the summary of Southwestern archaeology which it furnishes. It should stimulate further work of the same sort in the less well known portions of the Southwest and then the cry should be: "on to the South." What lies between the pueblos and the Valley of Mexico? Even without historical records it will eventually be possible to write a fairly full account of what has happened to man in America.

P. E. GODDARD

The Art of Old Peru. Edited by WALTER LEHMANN, assisted by HEINRICH DOERING. Publication of the Ethnological Institute of the Ethnographical Museum, Berlin. English Translation published by E. Weyhe, New York, 1924.

Among the several sumptuous albums devoted to Peruvian art which have appeared within the last few years, none is more magnificent than the present work, a quarto volume of quasi-de-luxe appearance consisting of twelve colored and one hundred and twenty-eight collotype quarto plates, sixty-three half-tone text figures and sixty-eight pages of text, admirably printed on excellent paper. The text consists principally of a twenty-eight page paper on "Historical Survey," with four pages of notes by Dr. Lehmann and a fifteen page paper on "Land, People and Monuments" by Dr. Doering. Titles, preface, map, list of plates and bibliography account for the other twenty-one pages. Two large chronological tables complete the total.

It is primarily as an album of choice examples of Peruvian art that this publication lays claim to the interest of students of American art and archeology, and on this score alone it deserves a place in the library of each. Its value is enhanced to the latter because of the fact that most of the specimens figured have never before been published, the majority of them pertaining to the famous Gaffron private collection.

> More than half of the plates, both of tapestry and pottery, have been taken from pieces of the choice Gaffron private collection in Schlachtensee. All the photographs from this collection show pieces which up to now have nowhere else been published. Similarly the great majority of the pieces from the rich collections in the museums in Berlin, Munich, New York and London are reproduced here for the first time in large plates. (p. 56.)

The majority of the rest of the plates are from specimens in Germany, and other private collections, such as the Sutorius collection of Stuttgart, are well represented, thus affording a wealth of hitherto unpublished material to students on this side of the water. All of the color plates, which illustrate mainly textiles, are from the Gaffron Collection. The colors are admirably reproduced, and one cannot but regret that the great expense involved prohibited the reproduction of at least all the textiles in this form. In view of the enormous amount of suitable and available Peruvian material, the editor has done well to select principally specimens never before figured.

> In the present work an attempt is made to choose from the wealth of the antiquities of Peru, pieces of different periods and cultural spheres which are artistically important as well as archeologically significant. In this way, not only the narrow circle of specialists, but also all friends of true art, will be able to receive a living impression of the abundance, the individuality and the high quality of the creations of the spirit of Ancient Peru. (Preface, p. 5.)

The editor has apparently been most successful in his choice, though doubtless every Peruvianist will regret the omission of certain favorite pieces. Practically all the plates are devoted to pottery, textile, stone, wood and metal objects, only one-ninth picturing architecture. In several instances, obviously with the purpose of figuring the object as large as possible, the photograph has been trimmed too close and a better artistic effect would have been secured by illustrating the entire object with suitable margin. The editor's penchant for Nazca pottery is evidenced by his selection of thirty-six pieces of Nazca ware as against, for instance, four from Ica, a preponderance hardly justified on either artistic or archeological grounds. Chancay and Ancon are similarly slighted, but with more justification. One misses on the map the locations of the proveniences of several specimens figured, such as Ancon.

A few minor errors in numbering and translation mar the otherwise excellent effect. The error in numbering plates 5 to 10 is noted in an accompanying erratum slip, but other errors in referring to "upper, lower, right, left" may be confusing to the conscientious reader. The animals figured on plates 46, 50 and 62, obviously frogs or toads, are termed "tortoise," possibly a mistranslation from the German.

The two accompanying papers by Lehmann and Doering are of an importance secondary to the plates and of interest principally to archeologists. Both are on the whole excellently translated with relatively few instances of stilted construction or poor choice of words. The translator should have been among those named and thanked in the preface.

Dr. Doering approaches the topic from the viewpoint of the artist. He analyzes the temperaments and peculiarities of the art of the several regions and finds that they reflect characteristics of climatic environment, the art of the torrid coast being imaginative and temperamental, that of the Aimara of lofty Tiahuanaco cold, restrained and impassionate, that of the Incas of Cuzco intermediate in temperament as in location, moderate, conservative and noble. In the massive regular Inca architecture he sees the embodiment and manifestation of the Inca state. He finds more individuality on the north coast, more conventionalization on the south coast.

Dr. Lehmann's "Historical Survey" is of interest to the archeologist rather than to the artist, though he also analyzes the spirit and nature of the artistic forms of the various regions and culture levels,

but rather from the historical standpoint than as the manifestation of national psychology. The artist unfamiliar with the topic of early America will find the paper a mine of information on pre-Columbian American historical relations, if a little confusing since the mass of material is poorly organized and unsystematic. It breathes the enthusiasm and vivid interest of the author. The Peruvian specialist also will find in it a tremendous fund of suggestion, more or less valuable. The article hardly pretends to be a properly developed scientific monograph, and the author does not attempt to prove any thesis, merely drawing on his great fund of knowledge of American archeology, and noting resemblances with every part of America on every possible topic. Some of the resemblances and analogies thus pointed out will not be accepted as valid by conservative archeologists, but they have their value as suggestions for consideration. They are too numerous to select and comment upon in particular. A large part of the paper, concerning the prehistoric relations of Mexico and Central America, while of great interest, seems hardly in place in a work on Peruvian Art.

The footnotes are many and full, but an unfortunate error in references destroys the correlation of footnotes 24 to 45, leading to the greatest confusion. The absence of references in text to plates and figures is also a lamentable omission.

Two tables of chronology complete Lehmann's text. Table A attempts a correlation of epochs, forms of thought, artistic styles and representative tribes and peoples. It is a valuable piece of work, one of the best of several such chronological tables which have been published by Peruvianists in the last few years. While accurate stratigraphical researches in Peru are still pitiably few and one of the great desiderata of American archeology, yet sufficient detailed studies have now been made to render the preparation of such chronological tables no longer premature but rather distinctly welcome as tentative hypotheses for discussion. The actual dates in terms of years given in the present table are well within possibility, but any assignment of actual dates on such slight evidence as Peruvian archeology offers at present is an attempt at which more conservative students have heretofore hesitated.

Table B is larger, fuller and more complex, a rather daring temporal and geographical cross-section of the entire field of Latin-American archeology from the Toltecs and Huaxtecs to the Calchaqui, involving considerations of language, artefacts, artistic styles,

migrations, traditions and mythology. While the many suggestive resemblances, culled from the author's unexcelled fund of knowledge of Latin-American archeology, are highly inspiring, the table as a whole suffers from over-complexity and would have been more impressive if the field of research had been more restricted. As before, the dates are reasonably conservative, and the table as a whole probably as good and complete as the all-too-meager data permit.

"The Art of Old Peru" is a work primarily for artists and students of primitive art, but of maximum importance as well to archeologists, both because of its wealth of otherwise unpublished objects and of suggestive discussion.

J. ALDEN MASON

ASIA

The Panchatantra Reconstructed. F. EDGERTON. American Oriental Series, vols. 2 and 3. American Oriental Society: New Haven, Connecticut, 1924. 408 and 405 pp.

The purpose of this work is to reconstruct the parent work from which are derived those collections of tales known as the Tantrākhyāyika, the Hitopadesa, the Kathāsaritsāgara, and the rest. The method is essentially the same as is pursued in collating manuscripts; there is this difference, however, that the derivatives do not strive to reproduce word for word the lost original; they retell and rearrange the original to suit the editor's taste. The author may follow the original fairly closely, or he may, like Somadeva, turn the whole into verse and retain only the substance. It is not therefore merely a question of eliminating clerical errors; but of determining what parts the existing tales reproduce verbally from the original, and what parts have been rewritten.

To this task Prof. Edgerton has brought a stupendous industry. He has compared every sentence of his ten derivatives, and further has had to collate the various manuscripts of the same derivative in order to establish his text. This minute analysis has not, however, impaired his judgment and he frankly admits that his reconstruction is only approximate. How approximate is clearly shown by the use of italics and brackets. The italics "indicate matter of which we cannot be sure that it literally corresponds to the original text." When we consider the amount of italics, often whole pages together,

with a sprinkling of certainties, one cannot help wondering whether the result justifies the enormous effort. In scholarship we must keep the end steadily in view. The author does indeed seek to justify his labours by pleading that "it must be worth while to recreate the original form of a work that has enjoyed such enormous popularity." To recreate it with certainty, perhaps; but since the exact text is largely doubtful the reconstruction will never be used as an authority; it is not likely ever to be quoted in support of historical studies; the existing derivatives will always be referred to because they are books that were actually written. Even if a certain reconstruction were possible it would scarcely possess the interest that would attach to a reconstruction of the original Mahabharata or Ramayana. The author is prepared to admit that the original work was as late as the fifth century and not earlier than the Christian era. The interval separating it from its derivatives is not so great as to make a profound difference in the opinions and customs of the times. In point of fact we shall find that the variations bear on words and phrases rather than on ideas that interest the student of customs. This is not to be wondered at since animal fables are singularly poor in information about customs, and I doubt whether the student could cull from Aesop or La Fontaine anything which he could not gather in less time and more fully elsewhere.

The translation makes excellent reading; in fact it might be criticized for making better reading than the original. The author has aimed at lightening the style, but in so doing destroys one of the characteristics of the classical Sanskrit, its fondness for interminable compound adjectives; they express what the best ages of any literature would put into a separate sentence, if they did not omit it altogether. By making them into separate sentences the author gives the reader who does not know Sanskrit the impression that the original was much more natural and popular than it really was. For instance paragraph 2 on page 271 appears in the translation as four sentences; but in the original it is only one, the last three sentences of the translation representing as many compound adjectives, one of them consisting of twenty-seven syllables!

By an awkward convention in the text contracted vowels are shown by the same sign as an elision. Thus *ceti*, for *ca iti*, is written *ce'ti*, as if the first *i* were elided, whereas it has fused with *a* into *e*. Contraction could more suitably have been expressed by a circumflex.

The orthography is modernized: *enuf* for *enough*, *huskt* for *husked*,

thru for *through*, to all of which no exception can be taken, but one would expect *thot* to rhyme with *not*.

The type and general get-up are excellent.

A. M. HOCART

ANURADHAPURA, CEYLON.

Growth of Chinese. S. M. SHIROKOGOROFF and V. B. APPLETON. Reprinted from The China Medical Journal, May, 1924. 14 pp., 4 tables, 6 figs.

These observations on weight and stature of more than a thousand Chinese children of the Eastern Provinces are a distinct addition to the scanty data from China. Averages with maximum and minimum instances in each age class are given. It is of importance to have some other expression of variability as well, or the seriations for each age from which these might be calculated, but these are not included. I have calculated the following increments and rates of growth.

Age	Increment				Rate of Growth			
	Male		*Females*		*Males*		*Females*	
	Weight (Pounds)	Stature (Inches)	Weight (Pounds)	Stature (Inches)	Weight (Percent)	Stature (Percent)	Weight (Percent)	Stature (Percent)
3	3.98	3.14	4.32	2.97	14.7	9.3	17.1	9.0
4	3.16	1.62	1.10	1.63	10.2	4.4	3.7	4.5
5	3.24	3.23	4.86	3.08	9.5	8.4	15.8	8.2
6	2.39	2.17	1.96	1.40	6.9	5.2	5.5	3.4
7	4.37	1.50	3.19	1.73	10.9	3.4	8.5	4.1
8	4.89	2.49	4.29	1.84	11.0	5.5	10.5	4.2
9	5.20	2.39	4.41	2.69	10.6	5.0	9.8	5.9
10	5.15	2.27	4.74	1.34	9.3	4.5	9.6	2.8
11	3.95	1.70	7.55	3.71	6.6	3.2	14.0	7.5
12	8.58	2.25	6.69	1.87	13.5	4.1	10.8	3.5
13	5.37	1.20	9.14	2.00	7.4	2.1	13.4	3.6
14	3.71	2.97	9.40	1.95	4.8	5.1	12.1	3.4
15	8.13	1.43	4.75	−0.30	8.9	2.4	5.5	0.5
16	10.08	0.24	0.03	1.03	10.2	0.4	0.0	1.8
17	−2.03	1.15	−0.26	−1.82	−1.9	1.8	−0.3	−3.0
18	5.84	0.15			5.4	0.2		
19	0.29	0.75			0.3	1.2		

The values are quite irregular, but suggest that growth in weight is slight after the seventeenth year in males and after the sixteenth year in females, with a similar phenomenon in stature beginning a year earlier in both cases. I cannot agree with the authors that the ages 6 to 15 are "critical periods" for stature of males at which the rate of growth changes. The linear equations for the growth curves, and the maxima and minima for each age class calculated from these, which the authors add, do not give any insight into the phenomena.

LESLIE SPIER

The Primitive Culture of India. Colonel T. C. HODSON. James Furlong Fund, vol. 1, pp. 1-133. London: The Royal Asiatic Society, 1922.

This book contains a series of five lectures delivered by Colonel T. C. Hodson at the School of Oriental Studies, University of London, in the year 1922. So small a book, dealing as it does with the cultural expression of millions of people spread over a territory of considerable extent and environmental variation, is bound to be a generalization. Almost every phase of material and immaterial culture is touched upon. Agricultural methods, metallurgy, pottery-making, wood and stone-working, fire-making, dress, dwellings, linguistics, myths, taboos, education, kinship systems, marriage regulations, ceremonies, cosmogonic beliefs, the life-cycle,—all these and their related topics are mentioned. In describing these features the author refers to the practices of various tribal groups in Upper Burma, Northern and Southern India, in Ceylon and in the Andaman Islands.

At no time are we told just what tribes have a specific custom for the author is not interested in cultural distributions or relationships. Though he admits that there are gradations within the "lower culture" he makes no differentiation in cultural status between those tribes that practice terrace farming or jhumning and those that have no planting at all but live on products of the jungle, by hunting and fishing. Similarly as regards other elements of material culture,—the people that use metals, those that have only stone or wooden implements, those wearing no clothing and those dressing elaborately, those erecting leaf shelters and those constructing plank houses, rambling forest dwellers and gregarious citizens,—all fall in the stratum of civilization termed primitive.

What, then, is its distinguishing feature? According to Colonel Hodson primitiveness is a matter of mentality not of culture. The latter, while preserving some of its ancient characteristics, suffers from contact with modern civilization and loses thereby the pristine quality which he believes adheres to the former. His evidence for this is the fact that in spite of native cultural achievements and the immediate presence of European civilization the peoples here dealt with still subscribe to the following practices,—assiduously adhering to tradition, permitting psychic experiences such as dreams and hallucinations to influence actual conduct, rationalizing custom, using concrete rather than abstract terms, crediting fantastic origin myths and believing in specific reincarnation. These are Colonel Hodson's criteria of primitive mentality.

The references from topic to literature are profuse which make the little book of value as an indicator of available sources on Indian and Burmese ethnology.

A. H. GAYTON

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DISCUSSION AND CORRESPONDENCE

Marquesan Culture

In a recent number of the *American Anthropologist* there appeared a review of my publication on Marquesan material culture in which I am severely criticized both for my conclusions in regard to racial movements in Polynesia, and for the methods by which they were reached. The reviewer lays great stress on the scantiness of the data available for comparative study, claims that I have ignored diffusion as an explanation of cultural similarities, and makes a general attack on my theory of Polynesian migrations, questioning the existence of distinct racial or cultural types within the region and accusing me of treating race and culture as a necessary unit.

I agree with the reviewer as to the scantiness of the data available for the Cook, Austral and Tuamotu groups and, to a lesser degree, for Tonga. Hawaii, New Zealand, Easter Island, the Marquesas and Samoa, on the other hand, are fairly well known and we have a number of good early accounts of the Society group. Although the data on these localities are incomplete, they seem sufficient to justify certain broad general conclusions as to cultural and racial relationships.

The claim that I have ignored diffusion as an element in the development of Polynesian cultures and as an explanation of similarities may be disproved by a few quotations from my publication:

> Western Polynesia was exposed to influences from both Micronesia and Melanesia. There is known to have been considerable contact between Samoa and the Gilbert Islands; and both Samoa and Tonga have been strongly influenced by Fiji. (p. 448.)
>
> The Samoan and Tongan cultures.... may be considered as developments of a single comparatively simple culture which has been modified by borrowing from several sources, (p. 461).

On p. 458 I list a number of traits of Samoan and Tongan culture which I believe to be of Fijian origin. Although diffusion has no doubt been of great importance in shaping the cultures of the relatively close-lying islands of western and central Polynesia, its influence must have been reduced to a minimum in the marginal groups.

Such localities as Hawaii, New Zealand, and especially Easter Island, were separated from their nearest neighbors by a thousand or more miles of open sea and there are no indications that they had any regular intercourse with the rest of Polynesia. The number of purely local features occurring in their cultures would, in itself, indicate a long period of practically independent development. They were no doubt reached by occasional voyagers and castaways, and in both Hawaii and New Zealand we have legends of immigrations subsequent to the first settlement, but their contacts with the outside world must have been few and far between.

The reviewer apparently assumes that the Polynesians are basically homogeneous in race and culture and says (p. 548):

> A fair consideration of cultural diffusion would tend to remove any necessity for the long series of migrations of distinct racial units bearing respectively distinct cultural traits..... If here be any strong evidence of such waves of racial immigration into Polynesia, well and good.

Recent studies of Polynesian physical type, summarized on p. 447 of my publication, seem to prove conclusively that at least three races are present in the region. Sullivan believes that the two non-Negroid stocks were relatively pure at the time of their arrival and says:[1]

> From the frequency and distribution of these two quite distinct physical types it is clear that they must have entered Polynesia at different times and possibly by different routes. Most probably they had different languages and cultures.

The Negroid element is stronger in Easter Island than in any other Polynesian locality,[2] and it seems improbable that any race which reached Polynesia only as an inclusion in some other stock should have been carried to this remote outpost in sufficient strength to become dominant there. The absence in Tonga of traditional or archaeological evidence of an early Negroid population is at least counterbalanced by the Tahitian legends of contact with dark-skinned aborigines and by the finding there of stone implements of Melanesian type which differ considerably from any of those known to have been used by the historic inhabitants. I believe that, until we have much clearer

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[1] Sullivan, Louis R., New Light on the Races of Polynesia, Asia, January, 1923 p. 19.

[2] Routledge, K., The Mystery of Easter Island, London, 1920, 295f.

evidence to the contrary, we are justified in assuming that each of the three races present in Polynesia entered the region at a different time. As any people capable of colonizing the region must have been relatively advanced in culture, it seems probable that each of these immigrant races brought with it certain distinctive cultural features.

The evidence for the existence of distinct types of culture within Polynesia has been presented in tabular form on pp. 449-457 of my publication and can not be repeated here. There are a number of cultural traits such as the fire plow, earth oven, digging-stick, bark cloth, etc., which are common to practically the whole of Polynesia. Many of these are also present in Micronesia, Melanesia, and even southeastern Asia. There are also a great number of traits which are limited to single islands or groups. Between these two extremes, however, there are certain groups of linked traits which show a definitely limited geographic distribution. These appear to me to be numerous enough to justify a division of Polynesian cultures into types comparable in a general way to the culture areas of continental regions. I do not claim that the cultures which I place in each type are uniform in all respects or that the various types differ in all particulars.

The almost complete isolation of the marginal groups favored the survival in each of them of the physical type and culture of its original settlers, except in so far as these were modified by independent development or later migrations. Gradual interchanges of blood and culture, such as that which went on between Tonga and Fiji, were not altogether precluded, but contacts were so infrequent that many centuries would have been required to bring about important changes in either by this means alone. The distribution of the various racial types in Polynesia as worked out by Dixon[3] shows a remarkably close agreement with that of certain cultural traits as worked out by myself, although the two investigations were carried on quite independently. In view of the peculiar geographic conditions it seems easier to explain this phenomenon by a theory of culture bearing migrations than by any other. The reviewer's statement that

> every important Polynesian cultural trait is definitely linked with a peculiar racial element which is credited with personally introducing that trait into every province where it is found, (p. 544)

[3] Dixon, Roland B., The Racial History of Man, New Nork, 1923.

goes far beyond my real claims. I have not attempted to ascribe any of the features of universal or purely local occurrence to the original culture of any of the racial groups present in Polynesia. I have also admitted the importance of diffusion in the western islands and have given, on p. 463, a number of traits which I believe to have originated in southeastern Polynesia and which I do not consider to be directly traceable to the original cultures of any of the races who settled in that region.

The reviewer especially criticizes my conclusion that cultures of the same general type as the Maori and Marquesan ones formerly existed in southeastern Polynesia. The resemblances of the Maori and Marquesan cultures are so numerous that I feel they cannot be accounted for by any theory of convergence. Many of their common traits are found nowhere else in Polynesia and there are also close similarities in terminology. For instance, the semi-sacred storehouse on posts, which seems to have been limited to these two localities, is called *pataka* in New Zealand and *fata'a* in the Marquesas. Direct contacts numerous enough to account for these resemblances were impossible because of the distance. Most of the historic Maori trace their descent from immigrants who traditionally came from Tahiti and the Cook group, and the Marquesans also were unquestionably in much closer touch with these localities than with New Zealand. Nevertheless, many of the traits in which the Maori and Marquesan cultures show the closest agreement are lacking, or at least very poorly developed, in the historic southeastern Polynesian cultures. We are forced to conclude either that such traits reached both the Marquesas and New Zealand from some unknown point, but failed to reach southeastern Polynesia, or that the Maori and Marquesan cultures represent marginal survivals of a type of culture which formerly existed in the intervening groups as well. The latter seems much more probable.

I am also criticized for my conclusion that the historic form of Hawaiian political organization was introduced into the group by immigrants from southeastern Polynesia. The Hawaiians have many traditions of a late migration from this region and ascribe to the newcomers not only the historic form of government but the introduction of human sacrifice, the enclosed temple (heiau) and the large vertical drum used in religious ceremonies. The political features resemble those of the Society group much more than they do those of either Samoa or Tonga, while the other features are all well

developed in southeastern Polynesia but are, with the possible exception of human sacrifice, lacking in western Polynesia. Although traditional evidence must always be received with caution, the stories of late immigrations to both Hawaii and New Zealand are supported by much genealogical and other evidence and cannot be ignored in any theory of Polynesian origins.

R. LINTON

TWO POINTS OF WESTERN DÉNÉ ETHNOGRAPHY

The annual Reports of the Canadian Department of Mines contain what might be termed an Anthropological corner under the able direction of Dr. E. Sapir, of Ottawa. What struck me as a most probable ethnographical inaccuracy was to be found in that for 1923, in connection with Harlan I. Smith's field work and its results; but I did not then deem it of sufficient importance to warrant my sending any words of rectification on the matter to the *American Anthropologist*.

The last Report, that for 1924 just to hand, by a new and undoubted inaccuracy of the same nature, aggravates the first enough to render seasonable, if not necessary, a few lines on what I feel to be deficiencies in both documents. My silence to-day, after what I wrote thirty-five years ago[1] would be tantamount to formal disregard of the rights of ethnological lore.

First as to what is most likely an error in the former. Harlan I. Smith is represented, on the occasion of his work in the Bella Coola area of British Cclumbia, as finding there "Carrier specimens," and taking "60 Carrier photographs from Bella Coola, B. C." (pp. 28, 30). Elsewhere, the Bella Coola and Carrier Indians are coupled together in such a way as to leave the impression that they live, or lived, in close proximity to one another. So much so, indeed, that a pictograph which is extant on a certain rock cliff in the land of the former is claimed by the explorer to be due to the latter (p. 32).

May I be allowed to put on record my belief that the Déné tribe here pointed out is not that of the Carrier, but that of the Chilcotin (*Tsilkoh-'tinne*)?

The oldest known seat of the latter tribe, whence a large part of its members migrated less than a century ago to the bunch-grass

[1] *Notes on the Western Dénés, ap.* Trans. of the Can. Institute, etc.

covered valley and plateaus of the Chilcotin River, was Nakûnt'lûn, an important village to the northeast of the headwaters of the Bella Coola R., and not far therefrom. Before moving to the southeast, the Chilcotin of Nakûntl'ûn had very frequent intercourse with the Bella Coola Indians, whose valley they had only to descend in order to find themselves on salt water, and procure those items of civilized life imparted by the traders established there.

In fact, I feel I am warranted in saying that this commerce resulted in intermarriages which notably modified the dispositions of the Southern Déné now called Chilcotin, adding as they did to their psychological characteristics a boldness foreign to the genuine Déné, a modification which was repeated further north when the Babine of Rocher Déboulé, on the Bulkley R., came in contact with the Tsimshian tribe on the Skeena called the Kitksons or Gitksans.

I can personally vouch for the fact that this commixing of the Chilcotin with the natives of the Bella Coola region was kept up long after the emigration of the Nakûnt'lûn people towards the Fraser R. More or less wild young men—and they were not wanting in that tribe—would, especially after disreputable deeds, or in the case of difficulties with their folk—make it a point to repair thither, and sometimes live for years among the Bella Coola Indians.

The same can be said of no Carrier bands, the southernmost of which lived to the north and never saw Bella Coola Inlet.

As to the Chilcotin, on the contrary, their past history is often taken up with the recital of affrays with Coast Indians and, later on, with intruding whites hailing from the same quarters. Witness, for example, the 1864 massacre, when seventeen white men and the squaw of another fell at their hands in the valley of the Humalkoh.[2]

With respect to the habitat of the Bella Coola, it is not that the Carrier are too far away therefrom to have been physically unable to leave there something like those specimens of their culture mentioned by Harlan I. Smith. Yet their own territory, their hunting-grounds and fishing-spots, do not reach much to the south of Dean or Salmon R., and the whole topography of the country, a perfect sea of mountains and deep valleys lying, as a rule, to the westward (which I explored in 1884), precludes the idea of any body of Carrier being able to visit Bella Coola by land.

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[2] For a full account of this massacre and the causes that led to it, V. my *Primitive Tribes and Pioneer Traders*, p. 314 of third edition.

Nay, even the very name of the Atnarko River, in whose valley the would-be Carrier pictograph is said to be seen, tells its own tale. It is a Chilcotin, not a Carrier, word, evidently standing for Atna-ĸoh, the river of the Foreigners. It would be Œtna-ĸoh in Carrier and 'Qætnè-ĸwah in Babine.

So much for Smith's pretended Carrier Indians, who are evidently nothing but unadulterated Chilcotin.

Now I hope that no one will be tempted to argue that the two tribes are so much alike that they can be taken one for the other. They differ widely in physique and dispositions, and their social organization is so unlike that the one follows matriarchate, while the other is governed by father-right. As to their respective languages, one may get a fair idea of their diversity by this little reminiscence. When stationed among the Chilcotin in 1882-85, I learned enough of their dialect to freely converse with them and catechize them without an interpreter. But when, in August of the latter year, I came in contact with the Carrier of Stuart Lake, I could not understand a word of what they were telling me.

In the Department of Mines Report for 1924, mention is made of "the Carrier Indians of Bulkley River in British Columbia" (p. 36); Mr. C. Marius Barbeau is shown continuing his investigations "among the Carriers of Hagwelgate" (p. 37), and Diamond Jenness appears as leaving for Hazelton, on the Skeena, "to carry out researches among the Western branch of the Carrier Indians resident in that vicinity" (*ibid.*), while, among the accessions to the Geological Museum of Ottawa, are shown "Carrier specimens from Hagwelgate" (p. 38) and Carrier photographs from Hazelton and Hagwelgate (*ibid.*).

But all those so-called Carrier are genuine Babines, members of a tribe, or sub-tribe, which, since the time of the first visit it received from D. W. Harmon, has always been considered a distinct ethnographical division. To understand this properly, one must appeal to the records of history no less than to sociology and philology.

In the first place, one should not forget that these appellations, Carrier and Babine, are due to the first traders who saw the aborigines thereby designated, and that these traders came from the east, not from the west or south.[3] Therefore, before they for the first time met the Carrier, Alexander Mackenzie and his French Canadian voyageurs

[3] Cf. *Primitive Tribes*, etc., p. 34 *et seq.*

had been told of them by the Rocky Mountain Sékanai among whom they first passed.

Now these Sékanai called their immediate Western neighbours *Arelne*, Carrier, from the custom of their widows to daily "carry" on their back the bones of their late husband whose remains had been cremated. These comprised the native inhabitants of Lakes Stuart, Tremblay, Tatla, Fraser and St. Mary's (Tsist'łatha), as well as the streams which connect them, and of the Upper Fraser and tributaries, as far south as the point which was to become Fort Alexander.

So far there was no question of the Babine, who were not discovered or named by the whites until some time after the establishment of Fort St. James in 1806.

Then the French Canadians in the employ of the North-West Company, who first saw them, were struck by the prominence of the lower lip of the women living on the banks of *Nato-pœn* (Babine Lake), a prominence which was due to the labret they wore, and for that reason called them Babine, or the Lippy ones.

That custom, which was absolutely unknown of the Carrier, they owed to the Western branch of their tribe—the "Carriers" of Dr. Sapir's Report—who hunted through the valley of the Bulkley R. and of parts of French and Cambie Lakes. These had in turn borrowed it from their immediate neighbours of Tsimshian parentage, the Kitksons of what is to-day called Hazelton.

Thus it will be seen that those pretended Carrier of the Bulkley are even more Babine than those whose habitat is the basin of the lake which now bears their name. Nay, they were for the Western Dénés the prototype of the Babine, and it would be the climax of inconsistency for an ethnographer to regard them as Carrier.

Of course, neither the lake or river Babine ever called themselves so. It is a well-known fact that in the same way as abstraction, though existing, is rare in the languages of the American Indians, even so they often lack the power of generalizing. They will have names for small ethnical groups, as a rule based on topography, but none for a tribe comprising several of these groups.

Thus it is that, as I wrote in 1892,[4] the Carrier know the lake Babine as *Nato'tenne*, people of Nato (who call themselves *Nitu'tinni*), and as *Hwotso'tenne*, people down by the current (*Hwotsu'tinni* in the

[4] *Notes on the W. Dénés*, p. 27

dialect of the latter) the Babine of Bulkley River—the 1924 Report's would-be Carrier—who form together one and the same ethnological division.

The latter half of the tribe, on the other hand, passed as *Akwilget*, or "well-dressed," among their Kitkson neighbours, and had never been called Carrier before the issue of last year's Canadian Report.

The particularity which was responsible for the name of Babine as applied to the inhabitants of Babine L. was to be found in an even more pronounced, or, at any rate, in an anterior, form among their congeners of the Bulkley valley, who had, indeed, taught it to the former.

As to the physical and psychological characteristics, as well as the language, of the two sections of the Babine tribe, they are identical, and I repeat that the lake aborigines became Babine only after their cousins of the Bulkley had given them the example of wearing the labret, which they owed to their heterogeneous neighbours on the Skeena.

A. G. Morice, O. M. I.

Taos Kinship Terminology

The following list of kinship terms were secured at the pueblo of Taos during the summer of 1924. The symbols used in transcription are: a, as in hat; ɑ, English broad a; ĭ, unrounded u; ɛ, open e; hl, surd l; th, strongly aspirated t.

Person, people: dai
Man: sĭan (also "husband")
Old man: hluhli
Young man: hlɛ, hlahle
Boy: ĭwiyu
Child, young, little, also son; also "old" as in "little old man": uu
Baby: fil
Woman: hliu
Wife: hlitu
Old woman: hliuu
Young girl: kwĭl

Father: tɑm (vocative titta)
Mother: ka (vocative hlau)

Grandfather (on both sides): ta hluhli (See "old man")
Grandmother (paternal): ahlu
Grandmother (maternal): hlitu (see "woman," "wife," and "old woman")
Uncle (paternal): thuhluu
Uncle (maternal): mimi
Aunt (on both sides): iyamē
Elder brother: papa
Younger brother: bāiuu
Elder sister: tutu
Younger sister: bāyuu
Son: uu (same as child)
Daughter: fiu
Nephew or niece (on either side): kihlu
Grandchild: (of either sex): maku
Father-in-law: maku (same as grandchild; sometimes makutam to avcid confusion)
Mother-in-law: maku (same as grandchild; sometimes makuhliuu to avoid confusion)
Brother-in-law: ta (same as grandfather)
Sister-in-law: sīai (compare sīan, man, husband)

JAIME DE ANGULO

NOTES ON THE SHELL-HEAP AT WHITMANVILLE, CAPE COD, MASSACHUSETTS

The shell-heap with which these notes are concerned is one which has already been remarked by Chase in the Smithsonian Report of 1883. On his map it is the most southerly one at North Truro. It is situated somewhat north of Corn Hill, to the left of the railroad on the slope of a hill through which a cut was made. It lies opposite a rather deep depression, in which is a small fresh-water pond.

The examination of the shell-heap by Chase was cursory. In his report he only mentions its presence and the finding of two arrow- and spear-heads in the cut just north of the midden.

Mr. William S. Hart, one of the gang that made the cut, who still lives at Whitmanville, informed me that the hill was a cemetery for the Indians, since when the cut was being made portions of human skeletons and numerous stone implements were uncovered. It is evident that there was at one time a considerable Indian encampment

located in the area described. It is the shell-heap, however, which attracted my attention.

The midden shows stratification. There are three distinct layers of shell débris. The bottom layer rests upon the native sandy soil. Between the bottom and the middle, and the middle and the top layers are strata of the so-called "black dirt" which in reality is ash and charred residues from fires. The thickness of the shell layers varies from the edge of the heap as thin and scattered to a thickness of from eight to ten inches as the center of the pile is approached. Owing to lack of facilities and time at my disposal I did not explore the entire area of the midden and can therefore give no estimate of its extent. In some places the shell-layers are almost a foot thick. The top layer is, at one place, about eighteen inches below the surface of the ground; at another place outcropping is evident.

The stratification of the midden indicates definitely that the spot had been used for the usual purpose on at least three occasions. It is consistent with the idea expressed by Gookin that the Indians of this region were migratory according to season rather than permanent inhabitants.

The shells found in the midden were of the type common to the region. There were many bones of small animals, both mammals and birds.

Many bone implements were found in the débris. They were browned with age and soft and crumbly. Some, however, were still remarkably solid and preservable. Fragments of arrow-heads, knives, spear-heads and other implements and weapons were abundant. Well-worked material was scanty. A stone pestle, a stone borer, several chisels and knives came to light. A large stone, which may well have been the head of a club, was found. It could hardly have been a hammer because its consistent smoothness was unmarred. There was also found a small slender stone of slate, on which could be detected fine scratches in a well-worn groove. This stone probably served as a sharpening instrument. The Indians of this region apparently used whatever stone material was handy for the fashioning of their necessary tools. The natural limitations of the local mineralogy made this imperative. Although cherts and flint are not native to the region, fragments of incompleted tools and much unformed matrix was found.

An interesting find was a number of sherds of pottery. These were apparently fragments of a vessel which had been broken and thrown

on the fire. The pottery was made of clay and pounded shells. It was decorated with a crude design, which had been applied by a small triangular pointed instrument.

Insofar as these remains tell a story, they indicate that the cultural level of the particular tribe or tribes inhabiting this spot was not high. This is in accord with evidence from other sources.

The specimens which were collected from this shell-heap have been given to the Peabody Museum of Harvard University. My appreciation is due Professor Roland B. Dixon of Harvard for his interest and assistance in the examination and interpretation of the find.

FREDERICK S. HAMMETT

ANTHROPOLOGICAL NOTES

THREE NOTEWORTHY Publications of The Folk-Lore Society are now published by William Glaisher, Ltd., 265 High Holborn, London, W.C.I. These are Basil Hall Chamberlain's "Aino Folk-Tales," 1888; Walter Jekyll's "Jamaican Song and Story"; and Ann Callaway's "Religious System of the Amazulu," 1870.

THE RUSSIAN INFORMATION BUREAU announces that institutions, organizations or individuals who are interested in exchanging their scientific publications or periodicals for similar works produced by the scientists of the Soviet Union may make arrangements to do so by applying to its headquarters at 2819 Connecticut Avenue N. W., Washington, D. C. This Bureau represents the Joint Information Bureau of Moscow which because of its continuous communications with scientific and cultural institutions of the Union of Soviet Republics is able to arrange for the exchange of their publications for those of other countries and to establish permanent contacts mutually beneficious to those concerned.

KNUD RASMUSSEN, the Danish explorer, has been awarded the Charles P. Daly Gold Medal of the American Geographical Society for 1924, for his explorations in Greenland and northern North America.

THE FIELD MUSEUM OF NATURAL HISTORY announces the following anthropological and archaeological expeditions for the year 1925:

The museum has commissioned Dr. A. L. Kroeber to collect archeological material in Peru and Bolivia. Dr. Kroeber's initial researches will most likely beat Tiahuauaco, on Lake Titicaca, high in the mountains between Peru and Bolivia. Although the Spaniards found the Incas ruling this territory, it has since been agreed that their dynasty was a comparatively young one, probably originating in the fourteenth century. Incomplete investigations made by various institutions have disclosed much that is mythical regarding the pre-Incas races. Sufficient material evidence has been discovered, however, to prove that civilizations existed as long ago as 1,400 years before the Incas.

The archeological expedition in Mesopotamia, conducted jointly by the Field Museum and Oxford University, under the leadership of Professor Stephen Langdon, during the past two years, will continue its operations through the present year. Important discoveries are expected to come from where excavations have gained great headway. The oldest pictorial writings have been unearthed from a palace believed to have been that of the first kings of Babylon. The excavators are now working into some of the more important burial places, temples and fortresses that are expected to yield material of vast importance in reconstructing the story of pre-Semitic and prehistoric Sumerian races.

Madagascar has been selected as the field for an ethnological survey, under the leadership of Dr. Ralph Linton. This is a most promising region for ethnological research. The inhabitants are of cosmopolitan lineage and many of the tribes are closely allied with the Malayan groups farther to the east. The island contains twenty-six different groups of people, which are sub-divided into a greater number of tribes. The southern tribes are almost unknown. They are believed to be descendants of people who ruled the island before the Hovas, the present so-called ruling class. The Hovas apparently came originally from Sumatra. Some of the other tribes are of the Mongolian type. Still others claim to be descendants of the Arabs. The expedition will attempt to make contributions to the early history of the migrations of the Malayan group.

An expedition to southern California, under the leadership of Charles L. Owen, will be financed by the Julius and Augusta N. Rosenwald Fund. Complete data concerning the Hupa, Yurok, Cahuilla and Chemehuevi Indian tribes of that region will be sought.

—*Science*,

Dr. Albert Ernest Jenks, professor of anthropology, on sabbatic leave from the University of Minnesota, sailed on January 28 to spend the remainder of the year in study and research in Europe. The first half of the year was spent in Washington. Dr. Jenks returns the last of June to join the faculty of the University of California for its Southern Branch summer session in Los Angeles.

—*Science*.

Dr. George Grant MacCurdy, of Yale University, was re-elected director of the American School of Prehistoric Research in Europe at the annual meeting of the managing committee of the school held in Washington, D. C., on January 3.

THE DEGREE of Professor of Anthropology has been conferred upon Mr. A. Matsumura, of the Imperial University. This is the first title of such a kind ever presented by the Japanese Government.

THE EXECUTIVE COMMITTEE of the American Anthropological Association recently passed the following resolution:

WHEREAS: The visit of the Secretary of the Interior to the Navajo Reservation, as reported in "Progress in the Handling of Indian Affairs," reveals the distressing fact that out of 8653 Indians examined, 1981, or nearly 23%, were suffering from trachoma, a highly infectious disease frequently leading to blindness, especially in reinfection cases; and

WHEREAS: The health situation in communities of the American Indians throughout the United States is generally unwholesome as a result of the diseases introduced among the aboriginal population by white men, and now constitutes a menace to public health not correctable by ordinary medical and sanitary agencies; therefore be it

Resolved: That the American Anthropological Association approves the efforts of the Secretary of the Interior to apply prompt remedial measures, and further expresses the earnest hope that the campaign be extended, that the cooperative health and welfare organizations of the country be asked to assist in every useful way, and that a special appeal for financial aid be made to foundations and other private sources if the available public funds prove inadequate to meet this crisis; and be it further

Resolved: That copies of this resolution be sent to the Secretary of the Interior, to the National Academy of Sciences, the National Health Council, and such other organizations as may be interested.

AT THE JOINT MEETING of the American Ethnological Society and the Section of Anthropology and Psychology of the New York Academy of Sciences held on March 23, 1925, an informal discussion was held on the topic, "Influence of Early Environment on Personality." The discussion was led by Professor William Ogburn.

THE EXECUTIVE COMMITTEE of the American Anthropological Association has voted to accept an invitation from the Social Service Research Council to become associated with it. This Council consists of three delegates each from the American Economic Association, The American Sociological Society, and the American Political Science Association.

THE UNIVERSITY OF HAMBURG has conferred the degree of Ph.D. *honoris causa* on Professor Robert Lehmann-Nitsche, Chief of the Anthropological Department of the La Plata Museum and professor of anthropology in the Universities of La Plata and Buenos Aires.

M. L'ABBÉ ROUSSELOT died in Paris on December 16, 1924.

MR. N. C. NELSON of the American Museum of Natural History has recently left for Asia where he is to be archaeologist of the expedition under the leadership of Mr. Roy Chapman Andrews which the American Museum is conducting in Central Asia.